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Railway & Commercial Gazette

Vol. CCXLI No. 6151

LONDON, JULY 10, 1953

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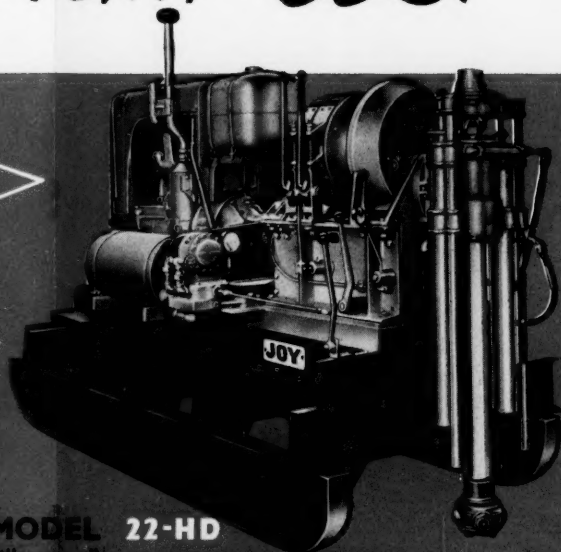
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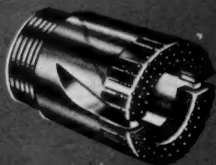
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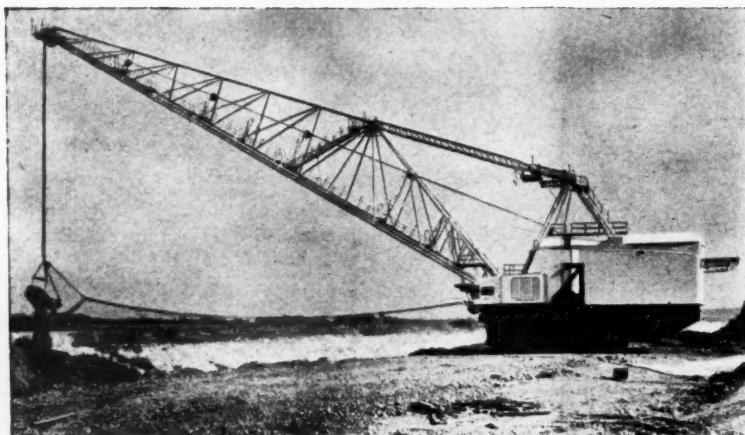


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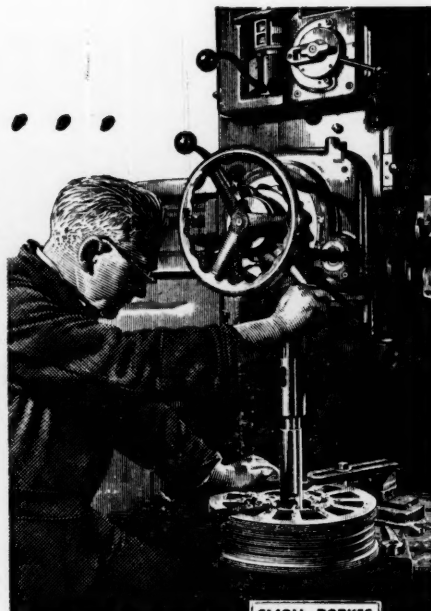
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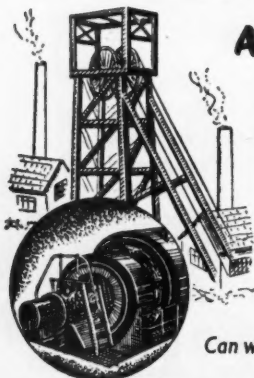
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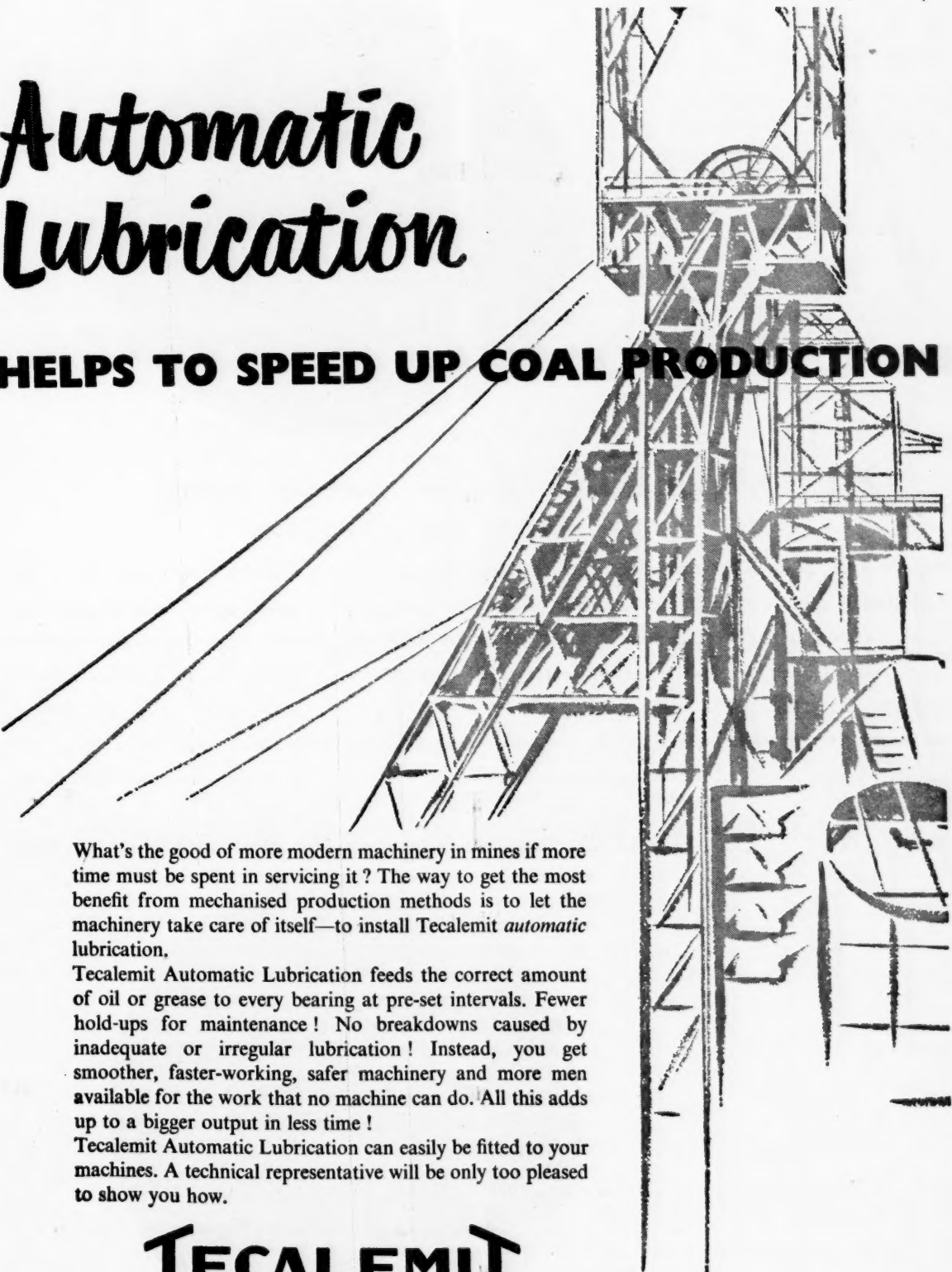
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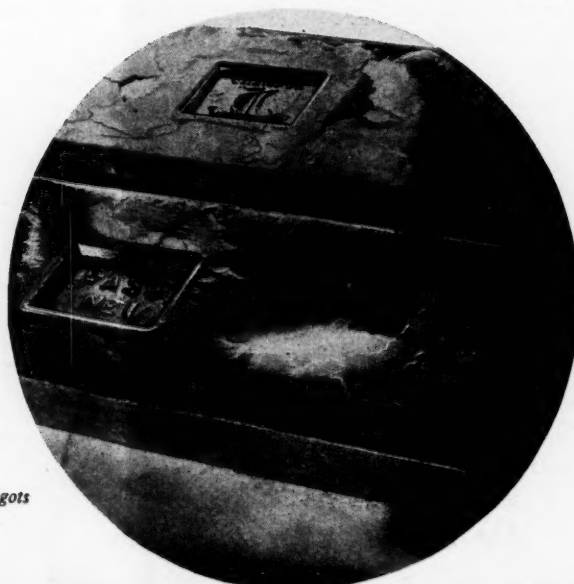
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Established 1835

Vol. CCXLI No. 6151

LONDON, JULY 10, 1953

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Published by The Mining Journal Ltd. at 15 Wilson Street, Moorgate, London, E.C.2. MONarch 2567 Subscription £3 per annum

NOTES AND COMMENTS

Research and the U.S. Mineral Industry

In 1940, a scientific mission from the United Kingdom Government was sent to Washington to facilitate the exchange of scientific and technical information. Australia and New Zealand also established scientific offices in Washington, and in 1943 both South Africa and Canada followed suit. Thus originated the British Commonwealth Scientific Office at Washington, which still remains a valuable and necessary element in the permanent machinery for scientific liaison. Formerly the missions were occupied mainly with research and development leading to military applications. Since the war ended, however, they have been increasingly concerned with scientific problems arising from their own country's particular economic and industrial needs.

For several years an annual review has been produced jointly by the five Missions which together make up the B.C.S.O.(N.A.). The latest review is the fifth of the series but the first to be published. Entitled "The B.C.S.O. Review of Science in U.S.A. for the year ending June, 1952," it is obtainable in Britain from H.M.S.O. and might almost be said to come under the head of prescribed reading.

Considerable prominence is given in the report to research and development associated with mining and minerals. Reference is made, for example, to the wide programme of research into methods, particularly chemical methods, for the beneficiation of low grade ores, which has been carried out with considerable success by a number of Government Departments working in co-operation with industry. This is well illustrated by the methods designed for the extraction of low grade manganese ores which combine acid leaching with electrolytic deposition. In Canada a plant is being erected for the production of copper, nickel and cobalt by a process which involves leaching of a mineral concentrate with ammonia. A wide search for new sources of selenium has been initiated. While the Eagle Picher Company remains the sole producer of germanium, a number of zinc producers are actively concerned with

modifying their production processes to permit the recovery of this trace metal.

There is far less pessimism to-day than there was five years ago about an immediate shortage of oil, for the ratio of new discovery and development to consumption has been maintained, and indeed increased. Nevertheless, the Paley Report emphasized the importance of encouraging exploration on government land, particularly off-shore, and of ensuring that the best methods of conservation are practised. It also recommended that research and development in the production of oil from shale and coal should be pressed forward. Taking technological and economic trends into consideration, Mr. Ayres of the Gulf Oil Company—one of the leading U.S. authorities on resources—has estimated that the first commercial oil-from-shale plant should be brought into operation by 1960, and that a considerable industry will be required by 1965. He considers that within the decade 1965-75 oil from coal will become a national necessity to supplement the natural resources of the U.S.

While the research work of the Bureau of Mines on oil from coal (by hydrogenation or by the Fischer-Tropsch process) and from shale continued throughout last year, there has been considerable controversy between the oil industry and the Bureau as to the cost of producing synthetic oil by hydrogenation. On the other hand, both the Bureau and the National Petroleum Council agree that oil from shale is near to becoming competitive with natural petroleum products. The oil-bearing measures in Colorado are remarkably thick, however, and can readily be mined at very low cost.

A third experiment in underground gasification, to test the possibilities of electro-linking, has been started in Alabama, where an international conference on the subject has been held. One of the leading coal companies is examining the feasibility of transmitting coal through pipelines.

Considering the U.S. concentration on room-and-pillar methods, B.C.S.O. considers that perhaps the most remarkable development in mining is the serious thought which is

being given to the advantages of the long-wall system. The development of continuous mining machines is being continued both by Bituminous Coal Research and by individual colliery companies, and improved machines from Germany have been well received.

Perhaps as a consequence of the bills before Congress, conferring on the Bureau of Mines a mandatory instead of their present advisory function, the research programme in safety is being expanded. The Bureau has also undertaken a new survey of the resources of coking coal, in view of the increased production of steel for defence.

Throughout 1952, the defence effort was the dominating factor in metallurgy, governing the course of research and development as well as production and consumption. Research supported by the Federal Government was largely directed towards the development of lightweight corrosion resistant metals and to potential high temperature materials. Private industry, on the other hand, was actively engaged in developing substitutes to eliminate or reduce the consumption of critical metals such as nickel, tin, columbium, cobalt and copper.

Research in titanium was concentrated on such factors as cheaper methods of production, remelting, casting, mechanical working, welding and heat treatment, and to the investigation of tensile, elongation, impact and corrosion resistant properties. Equilibrium diagrams have been prepared as part of a programme of binary and ternary alloy evaluation.

A number of new companies were formed during 1952, often by the combination of a titanium metal producer and a company having the capacity and technical "know-how" for the mechanical working of stainless steel. All commercial titanium is still manufactured by the Kroll process, but it is understood that considerable improvements have been effected in this process in respect of materials handling. It was anticipated that the total rate of production of titanium sponge in the U.S. would reach at least 5,000 tons a year by the end of 1952. In spite of the increasing scale of production, there are no indications that the cost of the sponge or wrought metal is likely to decrease in the near future.

The Bureau of Mines Station at Albany, Oregon, remained the largest producer of metallic zirconium, but the Atomic Energy Commission has endeavoured to interest private industry in meeting its requirements of the metal, which are expected to increase. As a result, a contract has been signed between the Commission and the Carborundum Metals Company, Niagara Falls, for the installation of plant to produce 150,000 lb. of zirconium per year for a period of five years. The magnesium reduction process developed by the Bureau of Mines will be used.

During the past decade the dollars available for research and development in the United States have increased by 270 per cent, the total expenditure for 1952 being estimated at \$2,932,000,000 compared with \$800,000,000 in 1941. Including work in its own institutions as well as that done under contract, the Federal Government now pays for 50 per cent of all U.S. research and development, compared with about 7 per cent in 1941.

The Development of Canada's Mineral Industry

Man's quest for metals and industrial development and the age old challenge of the Canadian Rockies are finally engaged in open combat. In earlier years the pioneering empire-builders sought out the few mountain passes through which to laboriously build their winding railway lines—the links which tied all Canadian provinces together in confederation from the Atlantic seaboard to the far Pacific. It is but 82 years since British Columbia became a

province of Canada. The first half of the current century witnessed cautious but steady rise in the growth of British Columbia's industries — more particularly, lumbering, mining, fisheries and a modest amount of agriculture. Always towering across her horizon of growth has been the mountain ranges which make up the Canadian Rockies—with man either hesitant or unable to meet their challenge.

In recent years, however, armed with new tools and weapons of science, a new generation is marching to a bold attack. As an indispensable aid to their progress is the financial wizardry of modern industry tycoons with their schemes and dreams in terms of projects involving multi-million dollar commitments even in their initial stages and ultimately rising to hundreds of millions—even the mention of a billion dollars no longer being a deterrent to their hopes and plans and courage. Moreover, it is regarded as being of important significance that it is private funds—private enterprise—which is providing the capital with which to carry out the gigantic projects. Already a small river of crude petroleum is flowing up and over the great mountain range from oilfields of the prairies to the Pacific coast. Soon a transmission line will send natural gas in great volume from the same region to fire the engines of industry beyond the mountains.

Meanwhile, a little farther north in the Kemano area of British Columbia, the Aluminum Company of Canada is spending hundreds of millions of dollars on a power development and aluminium project of unusual daring and magnitude. This includes a tunnel far into the mountains, a shaft to create a man-made waterfall of more than one-half mile vertical, a power generating plant within the mountains—and with a power transmission line made possible only through use of helicopters to string the wires across the great rocky canyons. Indeed, these helicopters are the sole means of travel communication to lofty crests upon which some of the tents of the construction crews are perched. In one such instance the landing "field" for the helicopter is a mere 14 ft. square. Here, where eagles alone formerly came to roost with prey in their claws for their brood, the helicopter settles gently down with food, fuel, water, and supplies for the construction crews spotted at intervals along the route.

And now, in 1953, come plans for another attack upon the mountainous barricades. This time it is still farther north in an area which straddles the boundary between British Columbia and the Yukon Territory. There it is that the genius and financial acumen of Thayer L. Lindsley is to direct the almost breathtaking development. Spearheading the undertaking will be Ventures Ltd., and its Frobisher and Quebec Metallurgical Industries subsidiaries. A tunnel of many miles in length is being planned to penetrate the Rockies to the great storage basin of thousands of square miles at the headwaters of the Donjek, Alsek, and Yukon rivers. The site of the proposed power plant is in Canadian territory about 35 miles east of Juneau, Alaska. An initial generating capacity of 25,000 h.p. is planned for 1955 and with a final potential development of more than 4,000,000 h.p. envisioned. The financial outlay will run into hundreds of millions of dollars and the period of total construction may extend over 12 to 15 years.

The objective is cheap power and accessibility to ocean shipping and a site for metallurgical developments involving ferroalloys such as ferro-chrome, ferromanganese, silicomanganese and ferrosilicon. This would mark the beginning, with a view toward ultimate expansion to embrace production of high grade alumina, pig iron and steel and the smelting of base metals. Ores for processing will come from not only Canada and the Americas, but also from Africa and elsewhere through the interlocking and far-flung mining and metallurgical activities of Ventures Ltd., Frobisher, and Quebec Metallurgical Industries.

Australia

(From Our Own Correspondent)

Melbourne, June 30.

The annual report of the Chamber of Mines of Western Australia for the year 1952 shows that the gold mines of the State treated 2,626,612 l.tons of ore for the recovery of 727,463 f.oz. of gold. In the previous year the Chamber reported the mining of 2,471,679 l.tons of ore for 648,245 f.oz. of gold. Dividends paid during the year were £A1,079,371 compared with £A1,000,469. The improvement is due in part to the improved returns from the mines of the Kalgoorlie field, and to the rise in grade of ore milled by Central Norseman Gold Corporation, but there is anxiety in regard to the Kalgoorlie mines as to whether higher grade ore is being drawn on and the life of the mines thereby shortened. In the present year, output should be further improved by the operations of Great Western Consolidated, and the increasing yields from the Hill 50 mine which is expected to show progressive improvement to and below the next level, probably about 950 ft., the present bottom level being at 820 ft. Operations of the Gold Producers Association also assisted the industry, though the distribution to members from premium market sales has been relatively small, and below the initial hopes. Since the incorporation of the Association in December, 1951, to March, 1953, 1,401,039 f.oz. of gold had been sold; the average selling profit above the Australian standard price of £15 9s. 10d. per oz. was £1 0s. 4d. Membership of the Association is 663, of which 448 are Western Australian producers.

DIFFICULTY IN ATTRACTING CAPITAL

The basic wage continued to rise during the year, but at a decreasing rate, the quarterly adjustments being 9s. 2d., 6s. 2d., 1s. 7d., and 2s. The total increase in the basic wage amounted to 18s. 11d. per week, against no increase in the price of gold. The minimum rate at present payable in the gold mining industry, inclusive of industry allowance, is 57s. 7d. per shift, or 147s. 9d. per week. During the year, new drilling equipment and tungsten carbide steel have been universally introduced on the mines with very beneficial results to the companies and to the men operating the machines; further mechanization has been carried out as far as possible, and the latest types of equipment have been introduced in the endeavour to reduce working costs, and in this regard, real progress has been made in the mines of the State in the last few years. There exists considerable difficulty in attracting capital for the discovery and equipping of new mines. Though there is evidence of continuance and prosperity, mining as an industry must weaken unless prospecting is vigorously carried on.

In the course of his address, the president of the Chamber, Mr. R. J. Agnew, referred to the help being given to prospectors by the State Government in the proposed use of small portable boring plants for testing areas uncovered by prospectors, the testing of which is beyond the powers of the men themselves.

Two branches of the industry are making substantial progress; pyrite production realized the sum of £A506,876 for the 12 months, and asbestos mining produced 3,290 s.tons of fibre from 101,910 s.tons of rock; value £A542,970.

Gold mining is the only branch of the mining industry that is exempt from income tax. Certain tax concessions of a partial nature have been given to certain other metals and there has been much anxiety lest such concessions might be withdrawn. A recent announcement by the Federal Government states that it has been decided to extend income tax concessions on profits and dividends from those profits on certain base metals and minerals, and concessions will also

apply to a new group of minerals and metals. The exemption provides for an exemption from income tax of 20 per cent of profits earned from the listed metals, and also from dividends paid out of those profits. Exemptions which are due to expire on June 30, will be extended for a further seven years, the aim being to encourage exploration and development of the minerals, and metals affected. New metals and minerals brought into the scope of the provision are: bismuth, columbium, osmiridium, platinum, selenium and tellurium; chromite, fluorspar, ilmenite, monazite, pyrite, vermiculite and zircon.

METAL PRICES AND DIVIDENDS

While these concessions are important, the fact remains that the dividends—if any—paid by many mining companies are a fraction only of the sums invested, and with the winding up of such companies the total disbursements are far short of the money involved. A concession that would be of far reaching importance in the encouragement of the industry would be the total exemption of all mining companies from income tax until the capital invested has been returned to shareholders.

The fall in the prices for lead and zinc are having their effect in reduced dividends by producing mines, and there is uneasiness that there may be a comparable fall in the price of copper, which will have serious influence on the large expansion projects of Mount Lyell and Mount Morgan mines, as well as on Mount Isa, which is bringing its big copper lode up to the rate of production aimed at. In common with the Broken Hill mining companies, Mount Isa Mines has cut its interim dividend, the cut being from 10 to 8 per cent, and for capital expenditure a large part of profits must be appropriated. Output of blister copper has increased from 1,003 tons in March to 1,405 tons in May, and profits from this section of operations will become of increasing importance to the company until some improvement in the market for lead and zinc takes place.

ROCK DRILLING IN WESTERN AUSTRALIA

Introduction of the air-leg combination, together with tungsten carbide-tipped steel has formed one of the most important developments in the State's mining industry. The effect of this drilling practice is clearly shown by figures recently issued by Gold Mines of Kalgoorlie Ltd. In driving and crosscutting Atlas long air-leg is used, the cross section of drives and crosscuts being 7 ft. x 6 ft. Efficiencies are: driving, 4.87 ft. per machine shift, or 4.25 ft. per man shift; crosscutting, 5.01 ft. per machine shift, or 4.11 ft. per man shift; rising, 4.88 ft. per machine shift, or 4.48 ft. per man shift; winzing, 3.08 ft. per machine shift, or 1.31 ft. per man shift. Dimensions of rises and winzes are 5 ft. x 4 ft.

Gain in efficiency by the use of the new equipment compared with the older, conventional equipment is marked. In the periods compared, 42 new equipment machines drilled 308,790 ft. compared with 75 machines which drilled 210,228 ft. The result is a decrease in the number of machines in use of 44 per cent, an increase of 47 per cent in the footage drilled, an increase in the footage drilled per machine of 162 per cent, and a decrease of 23 per cent in the overall cost per foot drilled. Increase in stoping efficiency is equally striking: tons broken per man shift have increased from 9.3 to 12.36, an increase of 33 per cent, and tons broken per machine shift have risen from 20.58 to 34.85 tons, or 69.3 per cent. Percentage efficiency increases per machine shift and per man shift respectively, are: crosscutting, 23 per cent and 44 per cent; driving, 18 per cent and 20 per cent; rising, 18 per cent and 52 per cent; winzing, 9 per cent and 21 per cent. Over 1,000,000 ft. have now been drilled with this equipment and the average footage per bit is expected to be between 550 ft. and 600 ft.

Mining Areas of Southern Africa Outside the Witwatersrand

Our South African correspondent sends us the following report of the recent presidential address given by Mr. C. G. Meyer, consulting engineer to the General Mining Group, before the Chemical, Metallurgical and Mining Society of South Africa. Although much of the material will already be familiar to our readers, we believe Mr. Meyer has performed a useful service in placing the Union's gold mining industry in better perspective *vis à vis* the rapidly growing importance of other mining activity in Southern Africa which already exceeds in volume that of the gold output of the Transvaal Chamber of Mines and Extensions by some 40 per cent.

To many people, mining in Southern Africa means primarily the recovery of gold from the fields of the Witwatersrand and the Orange Free State. Admittedly, these major goldfields represent the greatest concentration of mining activity in one continuous area in the world. Yet Mr. C. G. Meyer, consulting engineer to the General Mining Group, in his recent presidential address to the Chemical, Metallurgical and Mining Society of South Africa, discussed the importance of outside mining in Southern Africa, taking "outside" as meaning those operational areas outside the purview of the gold mines of the Transvaal Chamber of Mines. He said that there was a tendency to regard these activities as being of secondary importance, whereas he considered that the outside-mining field in the aggregate is of greater importance to Southern Africa as a whole than the Witwatersrand and Extensions.

Taking the outside field as covering the Union of South Africa, South-West Africa, Swaziland and Southern and Northern Rhodesia, the value of mineral production of the area during last year, excluding gold, was £193,000,000, compared with gold production of the Greater Witwatersrand amounting to £141,000,000.

The breakdown of this production during 1952 is as follows:

Copper	83,490,630
Diamonds	25,465,265
Asbestos	16,614,934
Coal	16,463,686
Lead and zinc	15,284,939*
Gold	12,951,795
Chrome	5,995,848
Platinum group metals	4,135,866
Manganese	4,116,680
Iron ore	1,056,099
Other minerals	7,273,176

Total £192,848,918

* Includes value of 15,457 tons of copper in concentrates produced in South-West Africa.

COPPER PRODUCTION EXPANDING

Mr. Meyer summarized the principal features of the production of these minerals in the various territories. During last year 350,059 tons of copper were produced, of which 312,354 tons came from the Northern Rhodesian mines. At present there are four major producers in the Copper Belt—Rhokana, Nchanga, Roan Antelope and Mufulira—situated in a belt stretching from 20 miles south-west to 60 miles north-west of Ndola. The ore deposits are found in the sediments of the Pre-Cambrian Lower Roan series, in which the primary ores appear as sulphide impregnations of remarkable persistence. The ore minerals are mainly bornite, chalcocite and chalcocite, accompanied by the cobalt salt linnaeite.

The ore bodies are from 20 to 12 ft. wide and of considerable lateral extent up to 8,000 ft., so that the ore reserves indicated by drilling can be measured in hundreds of millions of tons. The scale of operations is large, ranging from 120,000 to 330,000 tons a month and the grade is high, from 2.1 to 4.9 per cent. Further developing mines are now being equipped and the tendency is for this important

industry to expand, which will maintain its position as the premier mining field in Southern Africa outside of the Witwatersrand and Extensions.

The three copper producers in the Union are Messina, Transvaal, O'Okiep in Namaqualand and Tsumeb Corporation in South West Africa. The ore bodies in these mines are entirely different from those in Rhodesia. Messina has lodes in granite and gneiss. At O'Okiep, ore bodies are segregated disseminations in predominantly basic intrusives and that at Tsumeb is a pipe-like replacement in dolomite. Although exploration is taking place continually, there are no signs as yet of substantial new mines being developed to take the place of these mines in the Union or South-West Africa.

PRODUCTION OF DIAMONDS

Diamonds follow next in order of importance, the total production for last year being 2,920,661 carats, valued at £25,465,265. In the Union, diamond production comes mainly from five large mines, Dutoitspan, Bullfontein and Wesselton near Kimberley, Jagersfontein in the Free State; and the largest of all, the Premier Mine, north-east of Pretoria. They all work Kimberlite, an ultrabasic volcanic material of peridotitic composition largely altered to serpentine, younger in age than the Karroo system.

The system of mining adopted in the Kimberley mines is a modified system of shrinkage combined with pillar caving, known locally as chambering. At Premier, which was originally worked as a huge opencast, an interesting innovation so far as diamond mining is concerned has been embarked upon. This is sub-level stoping, with ring drilling to a huge slot which traverses the mine from one wall to the other. The bottom of the slot is served by a series of grizzly drives and ore passes to a main haulage which forms the link to the main shaft.

Diamond recovery at Kimberley operates on conventional stage crushing and concentration through primary and secondary pans, the concentrate being cleaned and further concentrated in jigs and pulsators, with final recovery over grease tables. Latterly, the concentrates from the pans have been passed through a sink and float plant and hence over grease tables. At Premier, sink and float methods are used to concentrate the whole product. A recent development in diamond mining has been the mergence of a few mines on Kimberlite dykes. These work narrow dykes only 30 to 36 inches in width and are more comparable with small gold mines than pipe diamond mines.

The main alluvial fields are at the mouth of the Orange River, worked by the Union Government and Consolidated Diamonds. Production from the famous old Lichtenburg fields is only on a relatively small scale. Alluvial diamonds as a rule do not adhere to grease tables. A new method of recovery worked out by the Diamond Research Laboratory is being used. In it particles are exposed to an electrostatic field and receive an induced charge. The diamonds, being poor conductors, are repelled by a high potential electrode, while other materials are attracted. By means of this diamonds can be separated from the gangue material without the previous laborious and expensive hand-sorting.

ASBESTOS

Asbestos mining, although practised for many years, has only come into great prominence since World War II. In Southern Rhodesia it is displacing gold as the mineral product having the greatest value. Total production for Southern Africa during 1952 was some 243,284 tons, of which nearly 85,000 tons were of Rhodesian origin; while 35,000 tons came from Swaziland and the balance from the Union.

Chrysotile asbestos is mostly derived from large belts of serpentine in the Eastern Transvaal, and Swaziland and the Shabani and Mashaba areas of Southern Rhodesia. Ore bodies are usually large both in strike and width. In the early stages the ore bodies are frequently worked by quarrying methods, but this is succeeded by cut and fill or block caving methods. Methods of recovery vary.

The two other types of asbestos in the Union are amosite and crocidolite (blue). The seams of amosite and Transvaal blue are somewhat irregular, but in some mines are consistent enough to allow of systematic development and stoping according to a proper layout plan. Many others, with relatively large production, merely follow outcrops by a system of "pig rooting" until mining difficulties render the seams uneconomical.

COAL AND INCREASING INDUSTRIALIZATION

Coal, particularly in the Union, is assuming greater importance with increasing industrialization, as there is at present no alternative supply of fuel for power on a large scale, and water resources are poor. Coal production last year was Union, 30,935,560 tons; Southern Rhodesia, 2,821,221 tons.

There are three main coalfields in the Union: the Highveld from the Witwatersrand westwards as far as Bethal and Carolina; the Southern Transvaal around Vereeniging and the adjoining Northern Free State; and portions of Natal. Mining conditions are favourable, in that seams are at shallow depths seldom more than 600 ft. from the surface, and they are of reasonable working width and continuity. The two main difficulties are the relative low grade nature of the coal, particularly in the Southern Transvaal field, and the scarcity of coking coal. The latter is found mostly in the Natal area and is not too abundant. Although there is no immediate shortage of coal for metallurgical coke, so necessary for the Union's iron and steel industry, the long-range outlook gives cause for some concern, although there is known to be some coking coal in the undeveloped Waterberg field.

A new enterprise in the coal industry is the erection of S.A.S.O.L., the utility company sponsored by the Union Government to produce oil from coal. This venture, situated south of Vereeniging, is of the greatest importance to the Union in view of the complete absence of economic oil resources in Southern Africa. If it proves a financial success, there is little doubt that it will be greatly expanded and followed by similar projects in the Union and Southern Rhodesia.

Southern Rhodesia at present has only one coal mine, the Wankie Colliery, some 70 miles south-east of the Victoria Falls. It serves both Rhodesias, but unfortunately the principal points of consumption are 200 miles away in Southern Rhodesia and 600 miles away in Northern Rhodesia. This introduces an acute rail transport problem. Wankie produces a high-grade coal which is also a coking coal, and in addition the seam is wide. A large expansion programme is being undertaken with the change of control from Powell Duffryn to Anglo-American. In common with most mining undertakings in Southern Africa it is plagued with a shortage of African labour.

Lead and zinc are obtained from Rhodesia Broken Hill in Rhodesia and from Tsumeb in South-West Africa. Both deposits are pipelike replacements in the dolomite and are phenomenally rich. Production is important although not large.

CHROME PRODUCTION

Chrome is essential to the steel industry. It is abundant in the Union in the Bushveld Complex, but is unfortunately low-grade, the average analysis being below 4.5 per cent. The chrome-iron ratio is also low for metallurgical purposes. Consequently, the industry is not as important as would be expected from the magnitude of the deposits. The position is not helped by the high cost of transport inherent in the heaviness of the ore. Standard open stope mining is usually practised in deposits of a convenient stoping width of 4 or 5 feet and a comparatively flat dip. In certain parts, the narrower seams have a better-than-average value and these are concentrated by gravity methods to be sold as chemical chrome.

Some work is being done on low chrome-iron ratio ores to produce ferro-chrome.

The Southern Rhodesia chrome industry is more important, as the chrome is of better grade and the chrome-iron ratio is suitable for ferro-chrome production. It is found in massive form near Selukwe and is mined by open stoping and other methods. It is also found in norites of the Great Dyke, which is an intrusive mass similar to the basic rocks of the Bushveld Complex of the Union. The chrome industry in Southern Rhodesia is severely limited by the ability of the Rhodesian Railways to transport its product and by the acute shortage of African labour.

Platinum is found in the Merensky reef in the Central and Northern Transvaal, traversing a zone of 300 miles. It is a segregation zone in the norite, which is so regular as to compare in mining with the Main Reef of the Witwatersrand. The bulk, unfortunately, is of low-grade and only the higher grade deposits in the Rustenburg area have been exploited successfully. Mining is carried out by standard methods. The stoping width is very low and great care is exercised to mine the ore body, which is flat and dips as cleanly as possible. The platinum group of metals is first recovered as metallics by gravity concentration, and then as a flotation concentrate which is smelted into a matte which is refined. It is considered doubtful whether there will be any great expansion in the form of new mines, it being thought more likely that the existing mines will increase their operations should world demand justify this.

Manganese is mined by open cast methods or modifications from tabular or irregularly shaped bodies situated along or near the contact of the Campbell-Rand dolomites in the Postmasburg area. It is also being worked in South-West Africa and to a limited extent near Krugersdorp on the Witwatersrand.

IMPORTANCE OF "OUTSIDE" MINING

Summing up, Mr. Meyer said that it could be seen that in the aggregate, "outside" mining was an immense industry, larger than even the great gold mining industry of the Witwatersrand. Spread as it was geographically over all the territories of Southern Africa, it was of great economic importance to them all, and could, in fact, be claimed as their mainstay.

The possible future expansion of these already important mining industries, as well as the use of many of the minerals as the raw materials of industries of great importance such as oils from coal, iron and steel, ferro-manganese and ferro-chrome, indicate that the outside mining field is the major field from which mineral development might be looked for in future generations.

Flame Proof Conveyor Belting

By S. J. SKINNER, Ph.D., B.Sc., A.I.R.I., Sales Manager, British Geon Ltd.

In *The Mining Journal* of June 20, 1952, an article entitled "Research on Conveyor Fires" emphasized that a conveyor belt in which PVC replaced the rubber in the covers and in between the plies was non-inflammable or self-extinguishing. A subsequent article in our issue of August 29, 1952, described one of the polyvinylchloride conveyor beltings manufactured in the United Kingdom for use in coal mines. The following article outlines the specific requirements for precaution against ignition which must be met by PVC belting during underground service, and considers some of the manufacturing problems which arise in meeting those needs. The article consists of extracts from a paper presented by the author at the British Plastics Exhibition and Convention on June 17, 1953, when he acknowledged the assistance of the Exhibition and Convention, the National Coal Board, the Ministry of Fuel and Power Safety in Mines Research Establishments, and the Research Association of British Rubber Manufacturers. A full report of the paper will appear in a forthcoming issue of *Plastics Progress*, 1953.

According to reports from the Safety in Mines Establishment and from the Insurance branches of the National Coal Board, no less than 75 fires occurred in underground conveyors during the period 1940 to 1950. Fortunately, it was not until December, 1948, that loss of life occurred, the first instance being at Whitfield Colliery where three men were trapped by fire. In September, 1950, however, the disaster at Creswell Colliery¹ where the death toll was 80, focussed attention on the need for work to be done on the problem of providing a non-inflammable material as a basis for conveyors in mines.

RESEARCH INTO MAINTENANCE AND CARE

Some important work on the subject of fires in conveying systems has been carried out, notably in Holland and in Germany, but as has been pointed out by the Research Department of the National Coal Board,² much of this work was concerned with the operation of conveyors and with recommendations for improved maintenance and care in the installations. It did not really concern itself with what is now recognized to be the underlying cause of conveyor fires.

More recently, W. Sardmann³ has published work on the improvement of the fire resistance of rubber conveyor belts, and A. Titze⁴ has published a paper which is concerned almost entirely with the use of Neoprene as the base material in the cover, and also in the fabric core of the belt. In the United Kingdom, some useful experimental work has been carried out by the Safety in Mines Research Establishment⁵ as a direct result of the fire at Whitfield Colliery, and finally a comprehensive series of experiments have been made by the National Coal Board Central Research Establishment, the results of which are summarized later in this article.

CAUSE OF FIRES

According to the National Coal Board Research Establishment, the origin of causes of conveyor fires can be classified as follows:

- (1) Fire generating in the belt which can be caused by friction, for example, when a belt folds or slips and the driving drum continues to rotate.
- (2) Fires generated in other parts of the system which are mainly due to rollers or idler rollers over-heating and setting fire to coal dust or other inflammable material.
- (3) Fires originating outside the conveyor system.

According to the same authority, of the 75 conveyor fires reported during the last ten years, 32 per cent are in Class 1, 52 per cent in Class 2, and 7 per cent in Class 3, the remaining fires being incapable of classification. It is interesting to note that according to the Safety in Mines Research Establishment, in no less than 21 of the fires, coal dust under the conveyor was ignited due to burning or very hot material dropping from the stalled belt. Conditions can exist in a conveying system when for some reason the belt becomes jammed and the driving rollers continue to rotate. Experi-

ments carried out by the Safety in Mines Research Establishment using such a system have proved conclusively that the generation of sufficient frictional heat to start a fire can be achieved very rapidly. The danger is particularly evident when forced ventilation of the type encountered in the pit is used, and when the belt employed is not new, and has been well impregnated with coal dust.

As a result of the report from the National Coal Board Research Establishment, recommendations have been made that in order to prevent conveyor fires, firstly the cotton duck should be fireproofed, and secondly, the material used as the coating and as the impregnant, should be of polyvinylchloride suitably compounded to be non-inflammable. This paper deals with some of the problems encountered in implementing these recommendations, and also considers recent work on the flame-proofing of natural rubber compounds.

METHOD OF MANUFACTURE OF BELTING

There are two types of belting in general use in mines, firstly, the single ply material, and second, the multi-ply. The production of the single ply material is relatively simple, and therefore most attention will be given to the methods used in the manufacture of multi-ply belting.

Multi-ply belting is produced either by making use of belting presses, or by a piece of equipment known as the Rotocure. In both cases, the general principle is the same, that is to say the fabric is coated or frictioned with a suitable material which is then made tacky by warming on a hot table, and the plies are then laminated together under pressure. The cover is separately produced and is combined with the plies either in a press, or in the Rotocure. Natural rubber is a most suitable material for use in these processes. Compounds containing it are readily made tacky and flow relatively easily at processing temperatures. Such compounds are also thermosetting materials which is very important since after curing, little cooling is necessary before opening the press, and in the case of the rotocure, the hot tear strength of the vulcanized material is high enough to prevent delamination, as the finished belt is released from pressure.

COMPARISON WITH RUBBER PROCESS

Thermoplastic materials such as polyvinylchloride begin at a marked disadvantage compared with rubber. Because of their thermoplastic nature, some arrangement for cooling the article being made under pressure must be made, in order to ensure that the plies do not delaminate. This means that the process used for rubber must be reversed. That is to say, instead of putting a cool material into the press or Rotocure and taking it out hot, the plies and cover must be combined at high temperatures and the assembled belt cooled, before removing pressure. Making such an arrangement is a major problem to those manufacturers having large belting presses, with cast iron platens which are

not only difficult to cool, but can also be ruined in the process.

SOLVING THE PROBLEM

There are a number of types of compound, not all based upon PVC, which are non-inflammable, and which can be adopted for the production of belting. Taking natural rubber compounds first of all, these can be flame-proofed either by the use of non-inflammable materials such as chlorinated waxes or by the use of conventional flame-proofing agents such as antimony oxide. More recently, it has been discovered that certain vinyl resins, notably copolymers of vinyl chloride and vinylidene chloride containing up to 40 per cent of the latter component, are compatible with natural rubber and will impart to it a high degree of flame proofness.

Much of the work on the latter subject has been carried out by the Research Association of British Rubber Manufacturers. Very good physical properties are obtainable in a compound containing a 50-50 mixture of the rubber and the vinyl resin. Improved flame resistance has been obtained with other resins of the same type, but the physical properties, particularly after ageing have been disappointing. This work has shown that not less than 80 parts of the vinyl resin with 100 parts of rubber are required to satisfy the specified flame resistance of National Coal Board standards.

The most serious defects of the compound is the poor abrasion resistance which may, however, result from incomplete dispersion of the vinyl resins in the compound. This suggestion has been to some extent confirmed by the results of experiments in which a small percentage of a nitrile rubber were used in the compound to provide a base compatible with both rubber and the vinyl resin. Results indicated that the abrasion resistance as measured by the Akron machine of compounds containing as little as 10 parts of the nitrile rubber, were very good indeed.

While the results of the first work using high vinylidene chloride content resins with rubber are encouraging, it is still too early to say whether in fact such compounds are satisfactory in service. It is also not quite clear whether such materials are as effective in preventing the cotton duck catching fire as are normal plasticized PVC compounds. In the latter case, thermoplastic material melts at high temperatures and by saturating the cloth, acts as an effective flame preventative.

PVC IN BELTING MANUFACTURE

The difficulties encountered in the use of PVC for the manufacture of heavy duty conveyor belting have been briefly mentioned. This material can be used in general in the same production processes as are used for natural rubber or synthetic rubber. Success depends upon giving attention to the difference in the properties between thermoplastic and thermosetting material, and at the same time, bearing in mind the fact that vinyl resins are basically non-tacky materials.

The basic operations which have to be used in the manufacture of a laminated PVC belt are as follows:

- (1) Coating the base fabric by friction, calendaring, or spreading.
- (2) Building the belt core from the fabric produced in coating the base.
- (3) Combining and fusing the core.
- (4) Combining the core with the heavy cover while,
- (5) Covering the edges.

In a brief contemplation of these operations, it will be found that firstly, the average manufacturer will be faced with the necessity of working at temperatures considerably above those to which he is accustomed, secondly he will

be using a material which requires the use of high temperatures at some stage during manufacture in order to develop maximum physical properties, and thirdly, he will be handling a compound which has comparatively little tack.

Taking the last point first, tack can be increased by compounding modifications, particularly by blending straight PVC with various copolymer materials. For example in calendaring operations, the addition of a percentage of a copolymer resin having a lower softening temperature is beneficial. Where the process is one involving spreading, a mixture of the paste resin and a soft copolymer resin such as Geon 400X150 is suggested. Some of these compounds are self-adherent at lower temperatures, and gentle warming can develop sufficient tack to enable building operations to be carried out. After discussing in greater detail the various styles in belt construction, Dr. Skinner went on to consider likely developments in compounding.

FUTURE COMPOUNDING DEVELOPMENTS

If it were possible to make polyvinylchloride compounds thermosetting, at least some of the manufacturing problems mentioned above would be simplified. However, while it is possible to set such compounds by chemical reaction with the vinyl resin, such processes are not yet practicable in the case of belting.

It has been known for many years that certain synthetic rubbers, particularly those containing acrylonitrile are compatible with, and act as plasticizers for polyvinylchloride resins. The so-called Polyblend materials sold in the United States are in fact blends of vinyl resin and butadiene-acrylonitrile copolymers and they have the great advantage over normal vinyl compounds that the plasticizer is vulcanizable and the material as a whole is capable of being more highly filled than a normal ester plasticized compound. Unfortunately the standard Polyblends contain too high a proportion of the nitrile rubber to be sufficiently non-inflammable, and therefore they cannot be used alone for belting manufacture.

Recent work has shown that the replacement of up to 20 per cent of the ester plasticizer content of the compound with a butadiene-acrylonitrile copolymer will yield a material capable of satisfying the non-inflammability requirements. At the same time, the small amount of synthetic rubber present is capable of vulcanization, which results in a degree of thermosetting in the compound. Consequently, it is claimed that there is no need to cool the belting so much before releasing pressure.

If the results in these preliminary tests are confirmed, they could permit established belting manufacturers to change over more rapidly to production of non-inflammable belting based upon plasticized polyvinylchloride.

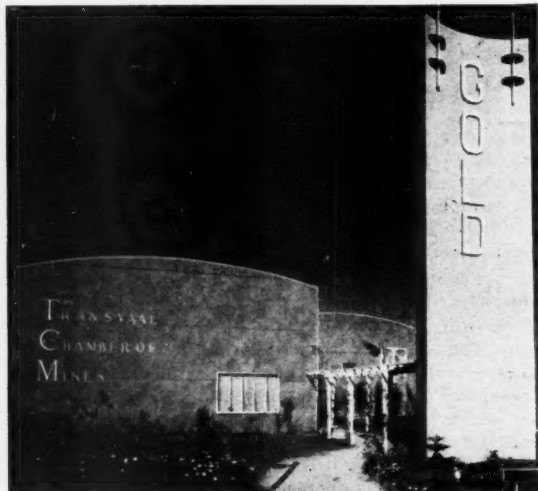
The problems before the rubber industry resulting from the decision to call for a non-inflammable belting based on a thermoplastic are considerable. So much progress has been made, however, that it is clear that compounding developments and plant modifications will establish such a production in a commendably short space of time.

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Highlights of the Bulawayo Exhibition

The focal point of the great Centenary Exhibition at Bulawayo, opened last week by the Queen Mother, is the Court of Rhodes. It is a collection of pictures, manuscripts, furniture and relics dealing with every aspect of the life of Cecil John Rhodes, who was born in Bishops Stortford exactly 100 years ago. Interesting as this Court is, it cannot be regarded as other than a record of the past. The living monument to Rhodes is rather in the pavilions devoted to the mining industries of Southern and Central Africa. Sir Ellis Robins is chairman of the Exhibition.



Exterior of the Transvaal Chamber of Mines Pavilion

The Transvaal Chamber of Mines, De Beers, the companies of the Copper Belt of Northern Rhodesia and the mines of the Belgian Congo, in addition to major financial support for the exhibition as a whole, have staged displays of various aspects of their activities. This great effort must be considered only proper when one remembers the part played by Cecil John Rhodes in the mining development of the Union of South Africa and the Rhodesias. His political activities are still the subject of fierce controversy, but his contribution to the fields of mining has never been questioned. Rhodes's first great achievements were in Kimberley and the Diamond Pavilion at the Exhibition is a worthy tribute to his memory as the founder of De Beers Consolidated.

CHAMBER OF MINES EXHIBIT

The Transvaal Chamber of Mines Pavilion has a number of interesting exhibits dealing with gold mining in general and with its latest activity, the recovery of uranium. The major portion of the display is devoted to the many varied aspects of African labour on the mines, particularly as a great proportion of this is drawn from the Central African Territories. Recruiting, training, working conditions and the economic importance of their employments to the territories involved are made clear by diagrams, models and photographs. The Witwatersrand Native Labour Association, the recruiting organization of the mining industry in the Northern Territories, has established a network of engagement centres in Nyasaland, Bechuanaland and Barotseland. It has constructed some 1,500 miles of roads and by motor lorry, river barge and aircraft, has opened up many remote parts of Central Africa previously inaccessible.

One of the highlights of the Chamber's exhibit is the smelting and pouring of £38,000 worth of gold into bar form, which is done every half hour. Another is the display of some £160,000 worth of goldware collected for the Exhibition from the great bullion firms of the Commonwealth.

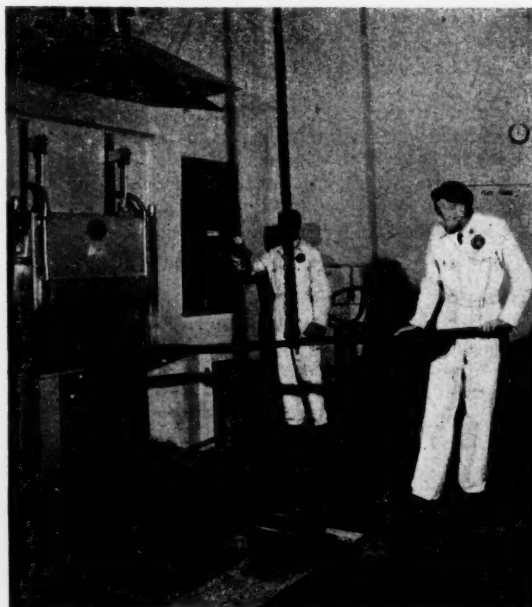
The Copper Pavilion is a striking edifice. Burnished copper crosses form the symbolic decoration of the front façade.

Copper crosses were the form in which Africans in generations past used to mould the metal for purposes of exchange. Inside, working models and activated flowsheets show the whole process of copper production from the mining of the ore to the refining of the metal; animated dioramas illustrate some of the main uses of copper in the modern world; a model house shows the many unsuspected uses of copper in building, and a tableau demonstrates the primitive African method of smelting and refining copper. Dioramas record the progressive improvement in the living conditions and amenities of the African workers in the Copper Belt. A huge relief map, electrically lit, traces the story of the development of the Rhodesias from the birth of Rhodes and the days of Livingstone to the present day. Apart from these exhibits, the Pavilion is a treasure house of antiquities. Through the co-operation of museums throughout the world a long list of ancient copper ware—some dating back 4,000 years—is on display.

THE BROKEN HILL AREA

In the adjoining Broken Hill hall, there is a working model of the first large hydro-electric scheme in Rhodesia, the Mulungushi Dam project, which supplies Broken Hill mine and town with power. A unique exhibit is a huge revolving relief map of Broken Hill. The visitor has the impression of flying over Broken Hill from north to south. Every house in the township, every pipeline in the plant, the headgears and buildings, the railway line, even the "slag greens" of the golf course have been modelled. There is also a showcase of the different types of minerals in the area—one of the most varied deposits in the world.

Each of the four mining companies in the Copper Belt has produced a working model of one of the four successive stages of copper production.



Smelting and pouring into bar form £38,000 of gold at the Transvaal Chamber of Mines Pavilion

What the copper industry means, and has meant, to the Rhodesias is recorded on a plaque in the Pavilion. For example, out of the estimated revenue of Northern Rhodesia for this year amounting to £28,000,000, the sum of £19,000,000 comes directly or indirectly from the copper mining industry. Of the total European population of 43,000 in Northern Rhodesia, 22,300 are in the four mining towns of the Copper Belt.

REVIEWS

Governmental Policies Concerning Unemployment, Inflation and Balance of Payments, 1951-1952.—Published by United Nations. Pp. 135. Price 7s. 6d. sterling.

The publication under notice is an analysis of replies by governments to questions concerning trends and policies bearing on the maintenance or achievement of full employment and on related balances of payments.

An annual inquiry concerning these subjects, conducted in accordance with a request by the Economic and Social Council, was initiated in 1949. It was greatly elaborated in 1950 and further modified in 1951 by the Council and in 1952 by the General Assembly. The major objective underlying the Council's request is to provide the means for a periodic review of the extent to which governments have responded to the recommendations of the United Nations with respect to national and international full-employment policies.

The questions, which were submitted to governments by the Secretary-General last February, were divided into two parts. Part A concerned domestic policies, and Part B covered policies relating to the balance of payments. By August, 1952, replies had been received from 25 governments; 17 of these replied to both parts of the questionnaire; an additional seven governments replied only to Part A and one only to Part B. It should be noted that with regard to 1952 the replies of governments relate to forecasts or objectives which may not necessarily have materialized. The actual figures will appear in the *World Economic Survey, 1951-52*, which will be published this year. The book is available from H.M. Stationery Office, P.O. Box 569, London, S.E.1, and at H.M.S.O. shops.

Gas: The report of the British Productivity team on the American gas industry. Published by the British Productivity Council. Pp. 194. Price on application at 21 Tothill Street, London, S.W.1.

The report pinpoints the sharp contrast between the gas industries in America and the United Kingdom, and emphasizes that there is no counterpart in the British gas industry to the rapid exploitation of natural gas resources which during the last decade has completely transformed the economic and technical aspects of the American gas industry.

Despite the great difference in character between the two industries the productivity team, led by Mr. J. H. Dyde, indicate many means by which American operating practice can, with advantage, be applied directly or in modified form to the British gas industry. However, the general view expressed by both American labour and management was that by its very nature, the gas manufacturing and distributing industry did not lend itself to incentive schemes, and that where increased productivity had occurred, this was due to improved techniques rather than to increased efforts.

The report is a substantial and comprehensive treatise that might be termed a handbook of modern practice. It is enhanced by the inclusion of 45 excellent half-tone plates.

Rudarsko-Metalurški Zbornik.—A new Yugoslav mining and metallurgical review. Price \$1.50 for single issue.

We have just received the first issue of a new Yugoslav review devoted to mining and metallurgy, called *Rudarsko-Metalurški Zbornik*. It is published at irregular intervals by the Faculty of Mines and Metallurgy of the Ljubljana Technical College and contains staff papers as well as other contributions dealing with the scientific and technical aspects of mining and metallurgy. Professor Victor Kersnic is signing as editor on behalf of an editorial committee. The editorial offices are at Askerceva 32, p.p. 311, Ljubljana, Yugoslavia.

The first issue contains contributions on the determination of maximum speeds for winding engines; the shortening of the oxidation stage in refining of copper; the bauxite reserves near Bosnian Krupa; the solution of the ventilation problem in Trepcia, and a paper on methane in mining in the light of recent results of researches. In view of Yugoslavia's important contribution to the world's supply of minerals and metals, especially non-ferrous metals, the publication of this new review is to be welcomed.

TECHNICAL BRIEFS

Ion Exchange System for Chromate Recovery

The need for the prevention of stream pollution and the critical need for chromic acid has caused American industry to consider a variety of disposal methods. There is a demand for equipment to recover chromium-containing ions from baths employed for anodizing aluminium, chromium plating, and copper stripping, in which processes chromic acid becomes contaminated with metallic cations.

One ion exchange method which is reported to be producing successful results in eliminating stream pollution and returning usable chromate to the treatment tank, utilizes synthetic resins. The system incorporates a cation exchanger to remove metallic cations from the strong chromic acid anodizing solution and an anion exchanger to recover chromate from dilute rinse solutions. Hydrogen ions are exchanged for metallic ions and the cycle is completed by using ion exchange resins for recovery of chromium ions, according to a report in *Industry and Power*.

The anodizing bath is operated at a pH between 0.7 and 0.9 and 50 to 70 grammes per litre of chromic acid. A portion of the bath is withdrawn each day and passed through the bed of a high capacity cation exchanger. Aluminium and other metallic cations are removed from this portion and hydrogen cations are substituted. The resulting solution, having a very low pH, is returned and mixed with the remainder of the chrome bath, lowering the overall metallic content and pH. When the resin becomes exhausted, it is regenerated by contact with sulphuric acid. The effluent sulphuric acid, along with the metallic cations, is sent to waste. This acid is then washed from the unit with water. The chromic acid is displaced with water, and this results in some desirable dilution.

A tank for the purpose of saving the rinse will conserve from 60 to 90 per cent of the chromate being dragged from the treatment tank. The remaining chromate still requires treatment, however, and is therefore sent through the bed of an anion exchanger, which removes chromate ions and substitutes hydroxyl ions. When treating virtually pure chromic acid, this results in the formation of water in place of acid. Because the equipment also operates as a water demineralizer, the rinse tank contains demineralized water almost exclusively. Thus, when chromic acid is removed, demineralized water remains that can be returned to the rinse tank for re-use.

It is reported that, compared with conventional disposal methods, this system costs 50 per cent less for initial instalment, operation costs are 75 per cent less, about 80 per cent less floor space is required, water and steam consumption is 85 per cent less, better plating and anodizing is obtained, and higher quality finish products are produced.

New Nickel Plating Process

A new chemical method for nickel plating, called the "Kani-gen" process, has been announced by the General American Transportation Corporation. It is said to provide plating equivalent to that achieved in electro-plating but with from one-third to one-half the nickel.

The process, requiring no electrolytic equipment, can be used to nickel-plate thermosetting plastic materials as well as various metals, including steel, copper, brass, bronze, stainless steel and aluminium, it is claimed.

A company official said the process could also be used to plate valves and other products which previously could not be plated successfully. Scientists with the company developed the process through the reduction of nickel by the use of hypophosphites. The process had been found practicable for pieces of any shape or size. It had been applied successfully for interior coating of tank cars. The cost of plating with the new method was estimated at from 50 c. to \$1 for each mill thickness of nickel per square foot.

A Non-flameproof Contactor Starter

In our issue of June 19, 1953, a note on the Belmos DO 30 automatic "direct-on" contactor starter described the unit as being flameproof. In fact, the unit is non-flameproof.

METALS, MINERALS AND ALLOYS

COPPER.—Under the influence of the American holidays, copper has been a very quiet but steady market with the domestic price 29.75-30 c. per lb. The prospective opening of copper dealings on the Metal Exchange early next month is increasingly looked forward to as the next development which is likely to set the course of prices. The New Standard copper contract has now been agreed and its main clauses are summarized on the opposite page.

Mr. S. D. Struass, of the A.S. and R. Company in reviewing the course of the copper market during the first half of the year said that consumption in the U.S. has been excellent with April deliveries at 142,282 s.tons, the highest to that date this year; deliveries, however, to foreign consumers were down—only 63,215 s.tons in April. This period has brought additional imports, more particularly from the Belgian Congo, N. Rhodesia, and Turkey, with Australia and Sweden, normally importers, also contributing. U.S. imports are currently estimated at some 10,000 to 15,000 tons per month, offered at or below the domestic price. Stocks held by the British Ministry of Supply had been estimated at as high as 200,000 tons, probably a large part would be maintained as a strategic reserve. Taking into consideration production costs, and the competition by aluminium, he thought the present price of 30 c. per lb. on the high side.

The Chilean Government continues to wait on events and has given no sign yet of reducing its price of 35½ c. f.o.b., and 36½ c. delivered, despite the accumulation of stocks, reported recently at some 45,000 tons. Meanwhile Kennecott has cut output at the El Teniente mine by 30 per cent. Chilean output in the first half of the year is given as 189,342 tonnes (Chuquicamata 92,744, El Teniente 72,413, and Potrerillos 24,185) as against 178,867 s.tons in the first half of last year. Chilean exchange has now been fixed at the uniform rate of 110 pesos to the S.

LEAD.—After the consistent advances in price during the last two or three weeks lead reacted somewhat on the Metal Exchange this week, which is not surprising with the advent of the holiday season here and in the United States, where however the N.Y. price is still 13½ c.

Mr. Strauss in the statement referred to above ventured the opinion that the bottom may have been reached in this metal, though on the surface production and consumption are in balance. There is no accumulation of concentrates awaiting smelting as in the case of zinc, in fact shortage of supply of raw material caused several producers to curtail operations. U.S. consumption has been able to sustain imports of 40,000-50,000 tons per month and were European demand to improve there might be a substantial advance in the lead price.

TIN.—Tin has fallen heavily since our last and closed in London on Thursday at £625-630 cash and £625-627½ for three months. New York quotation was 83 c. per lb. U.S. consumers are said to be holding off, being interested only in far-off deliveries such as November for which 81 c. per lb. is quoted. Quotations have now dropped by about £100 a ton in the past four weeks.

While it is notable that more realistic views have recently been expressed in Malaya where a fall in price seems now regarded as inevitable, this week's additional reduction obviously renders the question of price stabilization by output contraction more realistic; indeed, failing evidence that the United States stockpile buying is not going to dry up, contraction in output seems to furnish the only development likely to stop further decline.

There is, however, little evidence of this. Indonesian output in June is reported at 2,890 tons, making the six months' figure 15,598 as compared with 15,891 in the same period last year. In the last six months of 1952, production increased and resulted in a total for the whole year of 35,003 tons, but as may be seen there was not much reduction during the first half of the current year as compared with the same period last year. In Malaya the June production figure is not yet available, but with the May production of 4,646 tons noted in our issue of June 26, the five months' total was 23,269 tons which varied very little from the same period of 1951 and 1952. So far as these two of the chief producers are concerned, there is so far, therefore, no evidence of any sensible decline.

The Bolivian exports for the first quarter indicated a considerable increase. The U.S. Department of State has informed

the Bolivian Ambassador in Washington that the government is prepared to conclude a one-year contract for the purchase of Bolivian tin concentrates at the world market price at the time of delivery but what proportion of the production this would represent there is no means of knowing and it does not promise to advance the previous position very much. The Mutual Security Agency is prepared to recommend that the U.S. contribution to accelerate Bolivia's agricultural development and reduce its dependence on the tin industry might be more than doubled, and this does not suggest that the United States government entertains much expectation of Bolivia being able to escape from her financial difficulties through the medium of the tin industry alone. Even if the aid to agriculture were immediately forthcoming, its effects on the reduction of the cost of living and so of mining costs could hardly be felt quickly.

ZINC.—Metal Exchange prices this week have eased slightly but to a lesser degree than those of lead. The low price of 11 c. per lb. in the U.S. has affected the output of slab zinc, less quickly than has the fall in the price of its sister metal, lead.

Mr. Strauss has estimated that U.S. mine production has been forced down by some 25 per cent, as 11 c. is unprofitable for many mines and barely remunerative for most. He finds the explanation in the fact that zinc smelters normally carry much larger stocks of raw material than do the copper or lead reduction works, and so most smelters have continued to work at full capacity. Abroad many producing mines, in the main copper or lead producers, are stocking their concentrates rather than ship them for little or no return. Normally the U.S. and European smelters each import from 300,000 to 350,000 tons of zinc in ore, the U.S. primarily from Canada and Mexico and the European plants from Africa, with Australia and Latin America alternating according to the most profitable market. However, the smelters will not be able to continue to run on their stocks as they have done hitherto. Factors of uncertainty were what the British Government would do in the way of realizing its stocks of zinc, and, should prices rise sharply, could the stocks of accumulated zinc concentrates held overseas be absorbed without weakening prices?

The first of these points was clarified on Wednesday when the Ministry of Materials stated that the amount of zinc remaining for disposal was about 70,000 tons, which would be sold at the rate of 2,000 tons a month.

U.S. production of zinc in May was the lowest since February, 1950, at 46,839 s.tons.

ALUMINIUM.—It is reported from Vienna that the increased output of the Ranshofen Works, up to 37,000 tonnes this year, will be capable of supplying all the domestic requirements of the country.

Commander Robert Jackson, R.N., Special Commissioner for the Volta River Aluminium Scheme, has said that work on the scheme could not be begun before 1955 as it was necessary to prove that the scheme was absolutely sound technically. Thus any aluminium production from that quarter can only be considered a distant source of supply.

The Reynolds Metals Company reports rapid progress in the applications of aluminium for instrument lines of which an oil refinery may require 15 to 20 miles of tubing to transmit liquid and gas products throughout the works. The light weight of the tubing simplifies supporting structures and the aluminium requires no protective coating against the hydrogen sulphide normally present.

MOLYBDENUM.—The freeing of molybdenum from all domestic controls at the end of last month drew an interesting statement from the President of Climax Molybdenum, Mr. A. H. Bunker, who said that for the first time for over two years American industry can now get all the molybdenum it needs. He said that the Colorado mine at Climax, the world's chief source of the metal and incidentally the largest underground metal mine in the States, was now producing at a rate two-thirds better than last year and that in another 6 months this should increase to nearly 90 per cent. At the current output rate the ore body with some 750,000,000 s.tons would be good for about half a century. Among new applications, molybdenum-disulphide has been found to have very valuable lubricating qualities.

TUNGSTEN ORE.—There has been a bit of a flurry in the market over the last few days but it is thought to be a temporary rally for technical reasons. The market is very tight as regards supplies. Official buyers both in London and Washington are still out of the market.

GOLD.—The May output of Western Australia is officially reported as 60,589 f.oz., valued at £750,903.

The London Metal Market

(From Our Metal Exchange Correspondent)

The feature of the week has been the continued weakness of tin both in the East and in London. The fall can only be attributed to complete lack of interest on the part of buyers, as there have been no other factors involved except a vague announcement that some kind of contract for a year's output may be concluded between the American State Department and Bolivia which, if anything, is of a "bullish" nature. The Eastern price on Thursday morning was equivalent to £648½ per ton c.i.f. Europe.

Lead has lost a little in price, whilst zinc has remained steady, but the undertone of both metals is good and there is a possibility that in spite of the season a general rise in the price level may take place. A little more prompt lead is available, and this, combined with a lessening buying interest for prompt and current month material, has resulted in a decrease in the back-wardation to the benefit of the market as a whole.

The final details of the standard copper contract have now been agreed, and it is expected the various announcements with regard to the Bank of England scheme and import and export licensing procedure will be made in sufficient time to give members a clear fortnight before the market opens in which to study the whole position in the light of those few regulations which will still be in force.

Closing prices and turnover for the week are given in the following table:

	July 2		July 9	
	Buyers	Sellers	Buyers	Sellers
Tin				
Cash.....	£652½	£655	£625	£630
Three months.....	£650	£652½	£625	£627½
Settlement.....	£655		£627½	
Week's turnover.....	925 tons		865 tons	
Lead				
Current month.....	£92	£92½	£92½	£93
Three months.....	£89	£89½	£90½	£90½
Week's turnover.....	4,275 tons		3,300 tons	
Zinc				
Current month.....	£72½	£72½	£73	£73½
Three months.....	£72½	£72½	£73½	£73½
Week's turnover.....	2,775 tons		2,750 tons	

L.M.E. Standard Copper Contract

The new standard copper contract for the London Metal Exchange has now been agreed and will shortly be available for distribution. The following is a summary of the main clauses of the contract.

The standard copper to be dealt in is electrolytic copper in wirebars of between 200 and 275 lb. each, or high-conductivity fire-refined copper.

In addition, at seller's option, either cathodes assaying minimum 99.9 per cent or high-grade fire-refined copper assaying minimum 99.88 per cent in ingots or ingot bars, may be delivered at a discount of £3 per ton. Alternatively fire-refined copper assaying minimum 99.7 per cent in ingots or ingot bars, may be delivered at a discount of £10 per ton.

The delivery points in the contract are also at seller's option, and are: (1) in warehouse or ex-ship, London; (2) in warehouse or ex-quay, Liverpool; (3) in a public warehouse registered with the Metal Exchange in Birkenhead, Manchester, Swansea, Newcastle or Birmingham; (4) free-on-conveyance or works of U.K. smelters or refiners.

There will be a daily settlement, and dealings may take place for prompts on any day up to 3 months.

All metal dealt in on the Exchange will be of a brand or production registered with the Committee.

Iron and Steel

There is a swelling volume of evidence that the steel market is softening. Competition in world markets is becoming keener and although U.K. quotations generally bear favourable com-

parison with those of European producers, merchant bars are offered on the Continent at about £7 per ton less than the British price. Another limiting factor is the rigid system of import restrictions. Much more business could be done but for the delays in the issues of licences both in South America and Australia. Hopes are still entertained that these difficulties will be overcome and in the meantime the activity of British steel plants is sustained by a vigorous home demand.

Whereas German steel output in the first half of this year has definitely declined, British production figures which will be issued in a day or two will certainly reveal the attainment of an all-time record. Richard Thomas and Baldwins have announced that their Ebbw Vale works last week reached the highest steel making figure in its history, whilst British Railways carried more steel from the works than in any other week this year.

It seems that the approach of the holidays has prompted steel users to specify more freely. The Scottish holidays begin a week hence when many of the producing plants and some consumers' works will close down until the end of the month. Thereafter the same influences will affect production south of the Tweed and the normal flow of supplies will be interrupted.

Meanwhile capacity outputs are readily absorbed. For the most part blast furnacemen are satisfactorily coping with the heavy demand for pig iron and have also been able to build up their stocks. The only serious deficiency is in the supply of haematite iron which is still being imported. On the other hand purchases of foreign semis are on a reduced scale, since more home produced sheet bars and slabs are now available. There is however a scarcity of 2 in. billets, and further purchases of foreign steel plates are reported. Sheet mills are heavily booked to the end of September, but are open for bookings beyond that date, and there is also considerable pressure for tube strips.

JULY 9 PRICES

COPPER

Electrolytic £252 0 0 d/d

TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

ANTIMONY

English (99%) delivered,
10 cwt. and over £225 per ton
Crude (70%) £210 per ton
Ore (60% basis) 20s. — 22s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) £483 per ton

OTHER METALS

Aluminium, 99.5% £150 per ton
Bismuth Osmiridium, £40 oz. nom.
.. .. Osmium, £65/70 oz. nom.
.. (min. 4 cwt. lots) 17s. lb.
Cadmium (Empire), 13s. 10d./
14s. 4d. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £60 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%)
£280/£295
.. .. Silver 74d. f.oz. spot and f'd.
.. .. Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth 65% 9s. 0d. lb. c.i.f.
.. .. 40% 6s. 9d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £14 8s. 0d. per ton c.i.f.
.. .. (concentrates) £14 8s. 0d. per ton c.i.f.
.. .. Refractory £14 0s. 0d. per ton c.i.f.
Baluchistan Metallurgical .. £16 11s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £26 - £27 d/d
Magnesite, Raw £10 - £11 d/d
Molybdenite (85% basis) .. 103s. 10½d. per unit c.i.f.
Wolfram (65%) World buying 305s. - 315s.
.. .. 335s. Selling
.. .. World buying 290s. - 300s.
.. .. 325s. Selling
Tungsten Metal Powder .. 25s. 9d. nom. per lb. (home)
.. (for steel manufacture)
Ferro-tungsten 22s. 10d. nom. per lb. (home)
Carbide, 4-cwt. lots £35 13s. 9d. d/d per ton
Ferro-manganese, home £49 15s. 0d. per ton
Manganese Ore U.K.
.. (48%-50%) 6s. 1d. per unit
Brass Wire 2s. 6½d. per lb. basis
Brass Tubes, solid drawn .. 1s. 11d. per lb. basis

COMPANY NEWS AND VIEWS

Rand Profits Down in June

If further justification were needed for some of the disappointing June dividend declarations they may well be sought in the June operating returns for the Rand and O.F.S. producers published below. Of the 47 companies listed no fewer than 37 report profits for the month below those for May despite the average gold price being 2d. better at 247s. 1d. A number of the decreases are, however, quite slight and may be accounted for by the full day's holiday with pay which appears to have been generally granted throughout the Rand on Coronation Day.

Even so, the fact remains that disregarding West Driefontein and Stilfontein, for whom full comparative figures for last year are, of course, not available, 33 out of 45 of the mines in the list show lower cumulative profits for the 6 or 12 months since the end of their last financial year.

Company	June, 1953			Yr. ends	Current Financial Year			Yr. ends	Last Financial Year		
	Tons (000)	Yield (oz.)	Profit (£000)		Tons (000)	Yield (oz.)	Profit (£000)		Tons (000)	Yield (oz.)	Profit (£000)
Gold Fields											
Libanon	80	16,406	40-7	J	985	197,552	501	955	181,966	433	
Luipards Vlei	105	19,484	40-8	J	1232	231,234	568	1189	221,604	615	
Rietfontein	27	6,010	25-5	D	158	35,479	152	162	35,954	166	
Robinson	66	18,840	12-2	D	577	110,839	77	670	109,128	60	
Simmer & J.	121	19,335	11-4	D	723	117,857	76	741	117,957	97	
Sub Nigel	64	21,408	101-1	J	788	270,871	1,352	794	277,350	1,502	
Venterspost	101	23,861	57-1	J	1219	285,071	726	1180	260,650	726	
Vlakfontein	36	13,036	68-6	D	216	78,924	420	220	82,127	468	
Vogels	97	24,395	96-9	D	570	144,131	574	472	123,114	476	
West Drief.	41	29,004	231-1	J	386	261,743	2,033	—	—	—	
Anglo American											
Brakpan	114	20,464	20-6	D	684	122,492	125	692	126,521	224	
Daggafontein	214	50,402	312-7	D	1315	310,551	2,011	1394	332,713	2,362	
E. Daggafontein	91	15,751	46-1	D	536	93,652	289	579	103,713	383	
S. A. Lands	97	17,679	43-4	D	597	108,631	304	667	120,312	434	
Springs Mines	144	19,743	5-6	D	889	122,599	65	987	129,123	108	
Welkom	65	13,537	20-0	D	361	71,785	98	276	43,807	79	
Western Reefs	109	22,387	79-6	D	646	133,037	487	662	139,045	620	
Central Mining											
Blyvoor	98	58,140	479-8	J	1219	732,733	6,173	1298	819,176	7,327	
City Deep	153	30,485	20-1	D	943	183,222	140	920	185,209	161	
Consol M.R.	161	22,808	16-9	J	2107	293,871	270	2283	312,352	501	
Crown	263	42,578	37-7	D	1583	253,745	227	1594	259,828	216	
D. Roodepoort	172	29,867	58-2	D	1066	182,048	431	1073	183,722	492	
East Rand Prop.	187	41,555	101-4	D	1113	243,438	609	1249	267,783	916	
Modder B.	55	5,853	0-9	D	322	34,875	10	341	37,595	41	
Modder E.	115	13,220	16-2	J	1382	159,447	238	1409	165,656	350	
Rose Deep	75	11,184	10-0	D	442	65,129	44	504	69,940	67	
Welgedacht	32	4,028	3-2	J	401	49,815	52	405	47,758	49	
J.C.I.											
East Champ	21	3,637	L 1-0	D	145	23,816	12	186	28,299	50	
Govt. G.M.A.	240	33,444	55-1	D	1452	198,938	350	1420	192,358	298	
New State	27	4,521	1-0	D	193	29,273	6	269	39,248	6	
Randfontein	293	38,102	25-1	D	1833	236,306	167	2102	250,382	175	
Wit. Gold	61	348	L15-2	D	348	38,588	L	39	42,373	15	
Union											
East Geduld	133	39,901	296-6	D	806	241,796	1,793	864	259,223	2,045	
Geduld Prop.	92	14,726	30-6	D	571	89,955	195	626	90,829	230	
Grootvlei	180	38,238	218-6	D	1095	233,740	1,380	1163	252,047	1,616	
Marievale	64	15,522	66-2	D	370	90,817	397	361	90,423	421	
St. Helena	64	12,792	22-8	D	372	74,122	113	272	53,528	20	
Van Dyk	90	14,381	4-7	D	543	87,618	31	640	92,528	74	
General Mining											
S. Roodepoort	26	6,083	23-5	J	322	73,709	279	324	70,575	270	
W. Rand Con.	216	30,280	78-1	D	1340	188,345	549	1263	197,573	742	
Anglo-Transvaal											
N. Klerksdorp	10	1,443	0-3	D	61	8,427	5	66	7,425	6	
Rand Leases	158	26,981	18-4	J	2041	346,611	491	2218	372,157	952	
Village M.R.	33	5,157	12-2	J	405	63,228	166	409	63,619	205	
Others											
N. Kleinfontein	103	13,510	22-2	D	634	82,239	160	630	83,019	486	
Spaarwater	10	2,340	L 3-5	—	61	14,144	L	20	61	14,085	L 17
Stilfontein	65	19,825	102-8	D	367	103,427	494	—	—	—	—
W. Nigel	17	—	6-2	J	202	—	90	135	—	—	13

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (*) profit includes sundry revenue. Profit figures preceded by L indicate a loss.

Improved Showing by Phoenix Prince Gold Mining Company

This company affords what is in these days one of the somewhat rare examples of a gold mining company which is showing improved results. After six lean years during which no dividend was paid, a dividend of 5 per cent was paid for the year to March 31, 1952, out of the small accumulated earnings of previous years.

In the following year to March, 31, 1951, for which accounts

are now available, the working profit was, however, more than doubled at £54,882 as a result both of an increase in bullion revenue of £12,000 at £187,143 and a decrease of some £18,000 in mining costs at £132,936. After taxation amounting to £28,491 and provision for depreciation of £10,652 a dividend of 5 per cent is again being paid, this time fully covered out of the year's earnings leaving the carry forward £2,000 up at £11,228.

The tonnage milled was 4,000 up at 130,730 tons and the gold recovery up by 263 oz. at 14,147 oz. Although slightly more development footage was achieved during the year, ore reserves declined by 2,800 tons and at the end of the financial year stood at 11,800 tons averaging 2.96 dwt. over 56 in.

Bremang Maintains Dividend on Lower Output

The decline in Bremang Gold Dredging's output in 1952 comes as no surprise in view of the fact that the No. 2 dredge has been out of commission since the middle of last July, while while it is being dismantled and re-erected on the Offin River. In this connection it will be recalled that in 1951 the company acquired alluvial properties on the Offin and Jimi rivers from Gold Coast Selection Trust which are now known as Bremang Extended Areas. Good progress has been made with the re-erection of the dredge on its new site and it is expected to commence work next October. The African compound and European houses are also nearing completion.

Year to Dec. 31	Dredged (000 cu. yd.)	Output (f.o.z.)	Per cu. yd. Yield (grains) (pence)	Cost (pence)	Ore Reserves* Volume (000 cu. yd.)	Value (grains)
1950	8,707	37,916	2.29	8.07	37,948	3.14
1951	8,184	40,861	2.61	8.82	96,954	2.77
1952	7,034	34,969	2.60	9.92	91,692	2.74

* Figures for 1951 and 1952 include estimates for reserves under development in the Bremang Extended Areas, on the upper Offin River. In addition, there are a further 117,000,000 cu. yd. not yet under development in the Offin/Jimi reserves estimated to average 2.64 grain per cu. yd. and totalling 643,000 bullion oz.

The increase in cost per cubic yard in 1952 is due partly to the smaller yardage treated and partly to wage increases.

FLEXIBLE JOINTS



Naturally, we cannot claim the flexibility of this fellow's joints but we DO claim that 'UNICONE JOINTS' for pipe-lines have a unique flexibility, besides being leak-proof.

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THE UNICONE CO. LTD., RUTHERGLEN, GLASGOW, SCOTLAND

Dredges 1, 3 and 4 have continued operating on the company's original property on the Ankobra River. The results for 1952 were as follows (with corresponding figures in brackets for the first five months of the current year): *No. 1 dredge*, treated 2,302,700 cu. yd. for a recovery of 13,811 oz. (1,105,100 cu. yd. for 4,390 oz.); *No. 3 dredge*, treated 1,785,000 cu. yd. for a recovery of 11,757 oz. (1,001,400 cu. yd. for 6,657 oz.); *No. 4 dredge*, treated 1,984,900 cu. yd. for a recovery of 7,500 oz. (949,500 cu. yd. for 4,092 oz.).

The net effect of the working of these three dredges for the first five months of 1953 was to treat 3,056,000 cu. yd. for a recovery of 15,139 oz. and a working profit of £76,400, compared with 2,953,700 cu. yd. for 15,051 oz. and a profit of £63,800 in the corresponding period 1952, during which time dredge No. 2 was also in operation. It will thus be apparent that substantially improved operating results may be anticipated once this latter dredge has again become fully operation in its new paddock.

Year to Dec. 31	Bullion Revenue £	Mining Costs £	Tax* £	Net Profit £	Dividend %	Carry Forward £
1950	469,469	292,848	63,725	55,910	7½	24,819
1951	510,739	300,801	88,238	58,654	7½	41,964
1952	459,360	290,627	59,855	64,767	7½	20,572†

*Exclusive of Gold Coast gold duty of £28,379 in 1950, £24,005 in 1951 and £3,252 in 1952.

†After reserving £50,000 for removal of dredges.

Total revenue and mining costs both showed a decline in 1952 as a result of lower output. Taxation was also down by nearly £30,000 mainly due to a big reduction in profits tax, while further relief has been forthcoming as a result of a substantial falling off in the Gold Coast Government Gold Duty, which only amounted to £3,252 last year as compared with £24,005 in 1951. In consequence profit after tax was nearly £6,000 up at £64,767 and the dividend has been maintained at 7½ per cent. £50,000 has been put to reserve against the expenses of moving No. 2 dredge to the Offin River.

The chairman is Major General W. W. Richards. The meeting will be held in London on July 28.

Company Shorts

Decline in Diamond Gem Sales.—Sir Ernest Oppenheimer's warning at the recent De Beers meeting of the decline in diamond sales is borne out in the sales figures for the June quarter which are given below together with the comparable figures for the preceding four quarters.

Quarter	Gems	Industrials	Totals
June, 1952	£11,284,240	£8,136,752	£19,420,992
September, 1952	£10,058,235	£5,353,927	£15,412,162
December, 1952	£11,339,269	£4,621,038	£15,960,307
March, 1953	£14,507,190	£4,066,018	£18,573,208
June, 1953	£8,792,258	£4,084,716	£12,876,974

Harmony Seeks Increased Borrowing Powers.—Following on the announcement last January that Harmony had been added to the list of scheduled uranium producers comes news of plans to increase the company's borrowing powers from £2,000,000 to £6,000,000, to enable it to enter into formal loan arrangements with the Atomic Energy Board for the erection of a

uranium recovery plant, the cost of which is provisionally estimated at around £3,300,000. The announcement points out that as the company's cash resources will become exhausted during the next few weeks, the directors' existing borrowing powers of £2,000,000 will be fully utilized in the ordinary course of its gold mining business. In effect, therefore, the increased borrowing powers sought may be regarded as directly related to the company's uranium contract. As in other cases the uranium will be sold to the A.E.C. on a cost plus basis which allows for the repayment of the entire loan over ten years.

Killinghall Tin Raises Output, Lowers Dividend.—Due in part to the fact that Killinghall Tin's dredge worked throughout the year in virgin ground, output for the year to September, 1952, showed a substantial increase at 621 tons compared with 465 in the previous year, recovery per cubic yard being also higher at 0.69 lb. (0.64 lb.). As a result, although costs per cubic yard show an increase of a little over a halfpenny at 1s. 3½d. (the volume of ground treated being substantially the same in both years) costs per ton on the higher output were substantially down at £214, compared with £267. On the other hand, this improvement was rather more than offset by the fall in the price per ton received for tin ore which amounted to £528 against £595. On balance, however, the greater output more than offset the decrease in profit margin per ton, and the working profit before tax came out at £178,230 as against £141,894.

Taxation, however, was over £30,000 up, at £127,100 due in part to an excess profits levy of £18,000 against nil and in part to a £12,000 increase in Malayan income tax. Accustomed as we are to Malayan tin companies carrying a terrific burden of taxation it nevertheless comes as something of a shock to find that Killinghall is paying no less than 79 per cent of its earnings in taxation and export duty, the latter figure amounting to £66,672 in the year under review.

In view of the downward trend in the tin price the directors have wisely proposed to transfer a further £25,000 to general reserve and at the same time propose reducing the final dividend to 10 per cent making 25 per cent for the year as against 30 per cent the year before.

Tin ore output for the first 6 months of the current year to March last totalled 220 tons compared with 322 tons in the corresponding period a year ago.

The chairman is Mr. Jack Addinsell, the meeting is being held in London to-day.

General Mining Scheme Approved.—At extraordinary general meetings of shareholders of "Cris" and "Trams" held last week large majority votes were given in favour of the scheme put forward by General Mining and Finance Corporation recently for an exchange of shares as between the Corporation and these two investment companies, giving General Mining full control in each case.

New Board for Pari Tin.—Following the acceptance of the recent cash offer of 6s. 3d. per share for each of the company's 2s. shares the board of Pari Tin has resigned *en bloc* in accordance with the terms of the acceptance and a new board has been appointed consisting of Mr. R. A. Chettle and Mr. K. M. Parry.

Mr. J. Roy Gordon, vice-president and general manager of International Nickel's Canadian operations, has been elected a director of the company. Mr. Gordon has been associated with I.N.C.O. since 1936 when he was appointed director of the newly established research department at Copper Cliff.

Mr. K. C. Acutt has joined the board of the Anglo American Corporation.

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CONSOLIDATED MURCHISON (TRANSVAAL)

EFFECT OF REDUCED ANTIMONY DEMAND

Mr. B. L. Bernstein presided at the nineteenth annual general meeting of Consolidated Murchison (Transvaal) Goldfields and Development Company, Ltd., which was held on June 25, 1953, in Johannesburg.

The following are extracts from the statement by the Chairman, **Mr. S. G. Menell**, issued with the directors' report and accounts:—

An additional 27 claims have been pegged and the company's mining property now comprises 2,867 claims situated in the mining district of Pietersburg, and the freehold of a portion of the farm "Eiland" No. 134, situate in the district of Letaba, in extent approximately 167 morgen.

The net amount charged to capital expenditure for the year totalled £89,939.

Plans in hand for the increase of power supply on the mine have not been brought to conclusion on account of serious delays in the delivery of the necessary plant from the United Kingdom.

In the past year the price of jute bags has dropped considerably, and in order to bring it into line with current prices, the value of bags in stock at December 31, 1952, was reduced by £29,303.

The net profit for the year was £678,277.

Dividends Nos. 16 and 17, aggregating 140 per cent, absorbed £291,200, the sum of 160,000 was reserved to cover estimated taxation; and £89,939 was appropriated for capital expenditure, leaving a balance on appropriation account of £377,816.

The decrease in the profit as compared with the previous year was due to the fact that the exceptional demand for antimony which prevailed during 1951, was not maintained in 1952. By April, 1952, the price for 99 per cent antimony had dropped from £390 to £305. On May 12 it receded further to £270, and on June 18 to £255. Thereafter your company arranged to sell antimony at a fixed price for the remainder of the year irrespective of the price of 99 per cent antimony.

Production for the year amounted to 12,958 short tons of antimony concentrates and cobbed ore, and 7,436.52 ozs of fine gold. The stock of cobbed ore and concentrates held on the mine at the end of 1952 amounted to 4,879 short tons.

Working costs per ton milled, which include development charges, rose from 61.81s for 1951 to 87.09s for 1952. This increase is accounted for almost entirely by the decreased tonnage milled for the year, and the reorganisation of the mine which became necessary as the result of decreased sales of concentrates and cobbles occasioned by a marked decrease during the year in the demand for antimony.

DEVELOPMENT OPERATIONS

The Gravelotte Shaft was deepened to the 14th level, and development to test the continuity of the payable measures below 7 level was done on the 10th and the 12th levels. A limited amount of development on 10 level exposed good values and established the continuity of the main ore-bearing body below 7 level to this horizon. Five hundred and ninety-nine feet of development was done on the 12th level Reef Horizon exposing poor values. A considerable footage remains to be done on this and adjacent levels before any opinion may be expressed as to whether the payable lode does or does not persist to and below 12 level.

During May it became necessary to curtail mining operations on the antimony measures, and as a first step it was decided to place the Weigel, Monarch, United Jack and Jack West Sections on a caretaking basis. Operations were suspended, and by July mining and development had ceased on the last of these sections. Mining and development work continued at the Gravelotte Section till the end of October when operations were suspended. The caretaking of these sections is conducted in such a way that mining operations may be resumed in each case at short notice.

The predominantly gold-bearing Banded Ironstone and Free State Sections, where operations had been suspended during the period of antimony demand, were reopened, and mining and development operations were carried out from November onwards; the mill circuits were adjusted to the treatment of gold ore from these sections. The treatment of gold ore will continue to the end of April, 1953, when antimony ore from the Gravelotte Section will again be treated until such time as a stock pile of concentrates and cobbed ore of sufficient proportion has been built up when, dependent upon the sales effected at that time for forward delivery, it will be possible to decide whether or not to continue with the treatment of

antimony ores. If the circumstances are such as to indicate the desirability of suspending antimony production, it will be possible to continue with the mining and milling of gold ore from the sections referred to for some time after that date.

THE CURRENT YEAR

The estimated profit from antimony and gold for the quarter ended March 31, 1953, was £124,711. On the basis of the present price and demand for antimony ore, it is anticipated that during the quarter ending June 30, 1953, the estimated profit from antimony and gold will be substantially the same as for the March quarter. However, after June 30, 1953, unless the demand for antimony ore improves, your company will not be able to maintain this rate of profit and a considerable reduction must be expected.

The report and accounts were adopted and the retiring directors, Messrs. S. G. Menell and K. Richardson, were re-elected.

THE BURMAH OIL CO. LTD.

CURRENT YEAR'S SALES SHOW SATISFACTORY INCREASE

The fifty-first Annual General Meeting was held on Friday, 3rd July, in the Merchants' Hall, Glasgow, **Sir Kenneth B. Harper**, presiding.

In moving the adoption of the Directors' Report and Accounts the Chairman referred to his Statement dealing with the group companies' activities during the past year. The substantial fall in the trading profits—from £7,500,000 in 1951 to £5,500,000 in 1952—did not signify any weakening of the fundamental strength of the Companies' trading position. On the contrary, the volume of the group's trade had increased by 2 per cent, an increase sufficient to maintain their share of the market, though not enough to offset a narrowing of profit margins. He hesitated to forecast the future, so much depending on factors outside the group's control, but he could say that in the current year to date sales were showing a satisfactory increase over the same period last year.

Over past years about £10,000,000 had been spent in prospecting, with negligible results in terms of new oil fields, but there was now some ground for optimism in regard to at least two areas. Expert advisers were of the opinion that the gas field at Sui in Baluchistan promised more than enough gas to provide fuel for many years for all West Pakistan's industrial requirements, while the results just received of testing the lowest and possibly not the best of the four oil sands drilled through at Nahorkatiya in Assam suggested that the sand was capable of yielding moderate production. Evidence from this well was being applied immediately to the search for further oil in the large area of the Assam Valley over which the Assam Oil Company held the exclusive priority right to apply for concessions.

Labour costs were 300/400 per cent pre-war and for every £6 wages and allowances £1 was spent in housing, schools, hospitals and other forms of welfare. The group believed in improving the working conditions of their employees, but their efforts were in danger of being upset by the way the system of compulsory adjudication in industrial disputes was applied. However high the pay in relation to other comparable employment arbitrary awards of two, three or four months wages were being made, thereby encouraging the Unions to make further demands and doing great damage to industrial relations.

RELATIONS WITH ANGLO-IRANIAN

Referring to the recent issue of Debenture Stock by the Anglo-Iranian Oil Co. Ltd., the Chairman recalled the historic relationship between the two companies. Burmah Oil Company money and enterprise had first proved the existence in Persia of oil in Commercial quantities. When the Anglo-Persian Oil Co. was formed in 1909 the Burmah Oil Co. subscribed 95 per cent of the Ordinary Capital and guaranteed the Preference stock. In 1914 the Ordinary Capital was increased by £2,000,000, all of which was subscribed by His Majesty's Government. To-day the Burmah Oil Company held about 26½ per cent of the ordinary stock. The Anglo-Iranian Oil Company's important share in the Iraq Petroleum Co. also derived from Mr. W. K. D'Arcy's interest in Iraq acquired by the Burmah Oil Company along with his Persian concessions.

The Report and Accounts were unanimously adopted.

The Final dividend of 2s. 6d. per £1 unit on the Ordinary stock, less Income Tax at 9s. in the £, recommended by the Directors, was approved and declared payable on 17th July, and the balance of £596,047 was carried forward.

Lord Bilsland and Sir William Fraser, the Directors retiring by rotation, were unanimously re-elected and the proceedings terminated with a vote of thanks to the Chairman.

SAN FRANCISCO MINES OF MEXICO

The fortieth annual general meeting of San Francisco Mines of Mexico, Ltd., was held on Tuesday last in London.

Mr. C. E. Temperley, O.B.E., M.C., the Chairman, who presided, in the course of his speech said: The gross value of products sold was £9,386,000—or only slightly less than in the previous year. The net profit was £970,000, against £1,022,000. These satisfactory results were largely due to the company having begun the year with a substantial tonnage of lead sold forward. We were able to build up this position in the previous year when demand was good and prices high. Unfortunately we could not repeat this performance last year and we started the current year with a large stock of unsold lead.

Turning to operations at the mine, in the year under review the continued shortage of electric power and a fire at the South Shaft curtailed production up to February. But from February onwards, the tonnage milled averaged 60,000 metric tons per month, which is the full nominal capacity of your mill—and this is satisfactory as it is the first time we have been able to reach full capacity since the completion of the expansion programme.

The grade of ore milled was lower than in the preceding year. It paid us to mine out certain low-grade stopes which were prepared for mining when metal prices were higher. As a consequence, the tonnage of concentrates produced was slightly lower than in the preceding year in spite of the increased tonnage milled—but ore has been successfully won which in other circumstances might have been left in the mine.

A new Mexican Government took over on December 1, 1952, under the Presidency of Licenciado Ruiz Cortines. We believe Senor Cortines and his Government intend to follow much the same policy as the previous administration which showed itself decidedly more sympathetic towards industry and mining than its predecessors—and quite prepared to welcome foreign skill and capital.

On January 1, 1952, the Mexican tax on dividends was increased from 8 per cent to 10 per cent. Mexican production and export taxes, which are levied on the gross value of our products, took more than 40 per cent of the recoverable value of our ore, while Mexican income and similar taxes took a further 26 per cent.

This staggering burden will be lightened to some extent by the United Kingdom Finance Bill which is now in its final stages before Parliament.

Turning to our labour relations, the collective contract with our Mexican workmen expired in April of this year. The workmen's union made the usual exorbitant demands. After the customary protracted negotiations we agreed new terms at a level much below the terms originally demanded but still imposing a very considerable burden on your company. When these terms were submitted to the workmen for ratification, however, they refused to accept them, made further exorbitant demands and when these were refused struck work on May 6. A fortnight later on May 21 the workmen returned to work on terms which were only a trifle more favourable than those originally agreed to on their behalf by the union delegates. In addition, your company once again had to pay the workmen full wages during the period of this nearly pointless strike. The terms finally agreed provide for an 11 per cent increase in wages and for substantial new social benefits.

Mexican economy depends largely on the prosperity of its mining industry. The mining industry cannot prosper if its costs are inflated year after year in this way.

Given reasonable treatment in Mexico, our prosperity depends on metal prices.

Since the end of the company's financial year private trading in lead and zinc on the London Metal Exchange has been resumed. Opening prices were well below the Ministry of Supply's previous selling price and, since then, prices have fallen further. The tone of the American markets, where we sell our metals, has followed closely upon the sentiment in London. The current U.S. market price for lead is 13½ c. and for zinc 11 c.

The market in both metals is still far from strong but there are indications that marginal producers are finding it uneconomic to continue to produce at current prices. The loss of their production, as and when it occurs, may help to bring demand and supply more into balance. Recently consumers of both metals have been buying rather more actively.

The report and accounts were adopted.

The appropriation by the directors to re-investment reserve in the Mexican books of the company of 10 per cent of the profits in Mexico for the year ended September 30, 1952, after charging Mexican income-tax and Mexican Excess Profits Tax, was sanctioned.

FRONTINO GOLD MINES

The Annual General Meeting of Frontino Gold Mines, Limited, was held at Winchester House, London, E.C.2, on Tuesday last.

The Rt. Hon. Lord Rathcavan, P.C. (Chairman), who presided, in the course of his speech said:

The accounts for the year show a profit of £37,680 as against £99,764 in 1951, a decrease of £62,084. A comparison of the items in the profit and loss account shows that this reduction in the profit is in the main due to an increase of £143,334 in Expenditure in Colombia, which is offset by lower Colombian taxation of about £16,000 and higher Bullion Proceeds of £63,000. The increase in costs is to some extent due to the higher cost of stores, and heavier Colombian Import Duties, and also to the higher cost of labour. I doubt very much whether the ceiling of expenditure has yet been reached, as although there are signs of stability in the price of mining stores, the cost of labour shows no such signs.

Regarding the higher metals proceeds of £63,000, £18,000 came from the sale of lead concentrates, whilst the remainder was from the sale of Bullion, though gold production was actually down by 710 oz. The reason for this additional income from Bullion sales is that the special Bonus to gold producers, to which I referred last year, was increased during the latter part of 1952.

The Board recommend the payment on July 8 next of a final dividend of 1s. per share on the Preference shares, and a final dividend of 1s. 6d. per £1 stock on the Ordinary stock. Allowing for the interim dividends paid on January 1 last these proposals represent a total distribution to each class of 2s. per share or £1 stock. It is also proposed to transfer £20,000 to general reserve and to carry forward a balance of £53,386 which compares with £58,656 at the end of 1951.

Production in 1952 amounted to 117,323 tons milled, compared with 111,989 in 1951, and 62,121 oz. gold were recovered as against 62,831 oz. last year, a decrease of 710 oz. In addition to the gold and silver recovered, the production of lead was continued and resulted in a recovery of 707 tons of concentrates which it is estimated will produce about 363 tons of lead, 264 oz. of gold and 29,000 oz. of silver. In view of the necessity to conserve the slender reserves of ore in Silencio while development is continued, the Board has authorized the mining of a somewhat lower grade of ore than formerly, and a target of about 4,500 oz. of gold monthly from 9,000/10,000 tons of ore milled has been set.

The total development in the year was 14,561 ft. and compares with 9,694 ft. last year, and 4,367 ft. in 1950, so that the rate of progress has been more than trebled during the last three years. Of the 14,561 ft. driven in the year 1,131 ft. in the drives averaged 28 dwt. over 35 in., 1,420 ft. in the rises averaged 25 dwt. over 37 in., and 223 ft. in the winzes averaged 36 dwt. over 59 in., making a total of 2,776 ft. with an average of 25 dwt. over 38 in. In other words the footage of payable ore exposed, was about the same as in 1951, despite an extra 5,000 ft. of development, but the average width of the lode decreased from 54 in. to 38 in.

ORE RESERVES

At December 31 the proved reserves were 186,804 mill tons of an average value of 15.7 dwt. per ton as against 201,125 mill tons of an average value of 18.2 dwt. per ton. In my remarks last year I said that I doubted whether anything had been added to the reserves since the end of 1951, and unfortunately the position actually worsened during the second half of 1952.

The three prospects which our Consulting Engineers have decided to concentrate on are Cristales, Cogote, and Cecilia.

During the year the Cristales mine was dewatered and cleared of silt, and driving proceeded north and south from the old headings. The advance north was completely barren, but the south drift advanced 252 ft. of which 55 ft. averaged 15 dwt. over 15 in.

At the Cogote crosscut considerable trouble was experienced due to heavy ground which necessitated a great deal of timbering and the advance for the year was only 215 ft.

Cecilia only came into the picture following the conference last Autumn, and some surface prospecting of the Cecilia region was done, without however disclosing any extension of the known Cecilia outcrop. Nevertheless it is planned to sink a small shaft below the Cecilia mine which was worked many years ago before the reconstruction of the present Company in 1911.

Since the end of the year very little work has been possible at Cristales, Cogote and Cecilia due to scarcity of supplies and labour and the need to utilize such resources as are available, for the more urgent needs of Silencio.

The report and accounts were unanimously adopted.

THE SCOTTISH AUSTRALIAN MINING COMPANY

The Annual General Meeting of the Members of The Scottish Australian Mining Company, Limited, was held at the offices of the Company, 197 Winchester House, Old Broad Street, London, on Friday, July 3, Mr. John Norman Eggar (Chairman) presiding.

The Chairman said:—

Before asking the Acting Secretary, Mr. Snow, to read the Notice convening the Meeting, I must refer to our Secretary, Mr. Freeman. He became seriously ill in January last and in April was moved to Mundesley Sanatorium in Norfolk, suffering from tuberculosis. He had a setback last month, but is slightly better. His recovery must necessarily be slow, but we all hope it will be complete. The Report and Accounts have been in your hands for the requisite period. May I take this as read. (Agreed).

The coal output from the collieries working on our Estate was 93,715 tons or 7,416 tons in excess of the previous year. The increase occurred chiefly at Lambton Central No. 1; the output from Crofton, on the other hand, was down by 6,880 tons. I wish I could report favourably about the coal trade in New South Wales, but the position is far from satisfactory. Strikes are constantly occurring over what appear to be the most trivial matters, and the amount of coal lost by strikes in the present year to date is really alarming. Strong efforts are being made by the Coal Board to foster the export trade, but no really first grade coal is available for export, and the prices asked for second grade coal are too high to be competitive with Indian and American coal in markets which would be natural for Australia, e.g. Japan. Moreover, Japan's lack of Sterling at the present time makes it more difficult to sell Australian coal to that market.

I might mention that the type of coal which the collieries working on our Estate produce is not first grade coal, it would come under the type of coal that is available for export.

LAMBTON ESTATE

No sales of property took place during 1952, but I am hopeful that within the next few weeks some 39 blocks in the area West of Croudace Street will be offered for auction. The road has been gravelled and sprayed, and our expectation is that the lots offered will find ready buyers. Further developments are being carried out at the gravel pit and Pit Paddock, east of Croudace Street, and it is hoped that further sales may take place during the current year.

Turning to the accounts. The income from royalties shows an increase of £1,061 over the previous year, but the total under this heading in the accounts shows only a moderate increase, which is because in 1951 there was a non-recurring item of £986 in respect of interest received from the New South Wales Housing Commission. There is a small increase in income from investments. We have larger holdings in Steamships Trading Co. Ltd., and The Broken Hill Proprietary Co. Ltd., and the interest from those investments more than covers the reduction in interest on our reduced holding of Commonwealth Loans. On the expenses side, administration expenses are practically the same as last year. Directors are now sharing £700 instead of £800 per year.

You will notice that Rates and Australian Land Tax have increased by £1,809—more than double the 1951 figure. The Unimproved Capital Value on which Rates and Land Tax are paid has been heavily raised.

As regards the Balance Sheet, the increase of £1,013 under the heading "Fixed Assets," is on account of expenditure on road construction for future subdivisions of land.

Our holdings in Commonwealth Loans has been reduced by £4,104. The final instalment on our increased holding of shares in The Broken Hill Proprietary Co. Ltd., accounts for the increase of £264 in the book value of "Other Investments." I might mention that our investment of £500 in The Harbour Newspaper and Publishing Co. Ltd., was written down to £1 years ago, but we have received regularly dividends of between 5 and 10 per cent in the last few years.

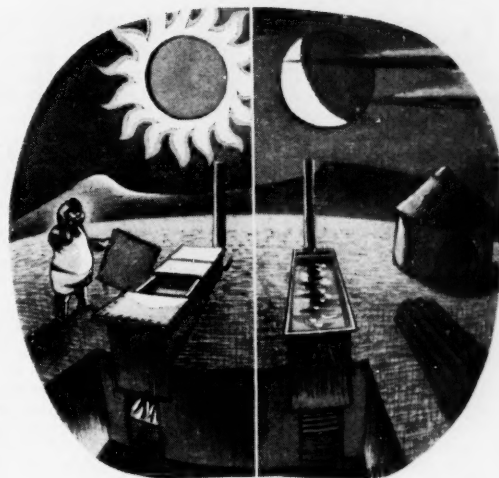
Capital Reserves. As I have already mentioned, no subdivisions of land took place last year, but final payments by land purchasers gave us £1,930, which we transferred from Land Sales Suspense Account to General Reserve. This enables the distribution of 1½d. per unit to be made.

The modest profits for the year will only admit of a dividend at the rate of 3 per cent, which it is proposed to pay on July 17.

In conclusion, I should like to record the Board's appreciation of the capable services of Mr. Lee and his staff in Australia, and of the staff here in London.

The report and accounts were unanimously adopted.

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KINTA TIN MINES

The fifty-second annual general meeting of Kinta Tin Mines, Ltd., was held on July 9 in London, Mr. A. G. Glenister, M.L.M.M., the chairman, presiding.

The following is his statement circulated with the report and accounts for the year ended December 31, 1952:—

I wish to refer to the great loss suffered by the company in the sudden death in October last of Mr. R. C. Savory. We feel that we have lost a much valued colleague and a personal friend. My colleagues did me the honour of appointing me to succeed him as chairman and the vacancy on the Board was filled by the appointment of his son, Mr. J. N. Savory.

The general managers' report gives full details of the year's working, from which it will be seen that a considerably higher yardage was treated and that there was a reduction in working cost of 2.27 pence per cubic yard. Ore production at 304 tons is 77 tons less than that for the previous year, owing mainly to a falling off in the grade of ground treated at the Damak section. This, together with the reduction in the average price received for our product, resulted in a working profit before taxation of £131,621, as compared with £218,653 for 1951.

Four interim dividends totalling 40 per cent. have been paid and in view of the uncertainty in regard to the future price of tin, your Board considers it prudent to carry forward the available balance of £24,726 without any further distribution.

We are pleased to have at last been enabled to clear up considerably the position between ourselves and the Malayan Government in respect of the loan for rehabilitation purposes which has appeared in our balance-sheets for several years past. The award was made known early this year and 95 per cent. thereof was allowed as a set off against the amount advanced. Repayment to the Government of the balance due has been made and the balance-sheet items concerned have accordingly been adjusted on this basis.

The position as regards the Sanglop Estate still remains uncertain. As you are aware, Rubber Estates received no advance assistance towards their rehabilitation and the awards being made in respect of their claims indicate that a very small proportion of our actual expenditure of £12,434 on reconditioning our property is likely to be received. £10,000 has therefore been written off this account.

PENAL TAXATION

The following figures show the penal effect of the tin export duty plus income-tax and other taxation charges for the year under review:—

Output—304.31 tons				
Taxation		£	Per Ton	Per Cent.
Tin Export Duty	...	32,869	108.01	20.04
Income Tax	...	58,901	193.56	35.92
Profits Tax	...	11,000	36.15	6.71
Excess Profits Levy	...	1,000	3.28	.61
		103,770	341.00	63.28
Reserves, Writings off, etc.	...	35,007	115.03	21.35
Dividends	...	25,200	82.81	15.37
		163,977	538.84	100.00

Outputs for the first five months of the current year total 116 tons.

FALL IN PRICE

Shareholders will have noted the recent large fall in the price of tin. The average cash tin price for metal during 1952 and for the first quarter of the present year was approximately £960 per ton. A serious break in the price level occurred early in April and since then the cash price has fluctuated between £776 and £692. This must inevitably have a serious effect upon the profits of all tin-mining companies and on the general economy of the countries which, like Malaya, so largely depend upon direct and indirect revenue from the tin industry. Already a number of Chinese mines in Malaya have been compelled to close down and a continuance of such a low price level will have serious consequences upon the output of the industry as a whole. Low prices will also have a grave effect upon the dollar earning capacity of the sterling area which has depended so largely in the past upon the contributions received from Malaya.

Unfortunately, costs, so easily forced up by labour and government requirements in times of prosperity, do not decrease in conformity with a fall in the price of the commodity concerned, but your Board are well aware of the changed outlook and, with the general managers, are examining every possibility of reducing the cost of production.

The security position in Malaya has greatly improved since we last met, although General Sir Gerald Templer, to whose handling of the situation the improvement is largely due, has warned us that the utmost vigilance is still necessary. What he has accomplished could not have been done without the ever-growing support of all sections of the community in Malaya and our best thanks are due to the general managers and staff, European and Asian, for their excellent work in the company's interest and for the steadfastness which they have shown under such trying and dangerous conditions.

The report and accounts were adopted.

TANJONG TIN DREDGING

The twenty-seventh annual general meeting of Tanjong Tin Dredging, Ltd., was held on July 9 in London, Mr. A. G. Glenister, M.L.M.M., chairman of the company, presiding.

The following is an extract from his statement circulated with the report and accounts for the year ended December 31, 1952:—

I wish to refer to the great loss suffered by the company in the sudden death in October last of Mr. R. C. Savory. We feel that we have lost a much valued colleague and a personal friend. My colleagues did me the honour of appointing me to succeed him as chairman and the vacancy on the Board was filled by the appointment of his son, Mr. J. N. Savory.

The general managers' report contains the usual particulars of the operations at the mine and details the working results obtained. The output was 981 tons of tin-ore obtained from the treatment of 4,205,960 cubic yards, representing a recovery of 0.52 lbs of tin-ore per cubic yard. This compares with 1,154 tons of tin-ore obtained from 4,397,400 cubic yards in the preceding year, representing a recovery of 0.59 lbs of tin-ore per cubic yard.

The working profit, before charging taxation, amounted to £375,830 as against £542,790 for the year 1951. Interim dividends amounting to 80 per cent. on the issued capital were paid during the year and, in view of the fall in the price level of tin and the uncertainties regarding the future, your directors have deemed it prudent to place a further £25,000 to general reserve and, after writing off £24,186 on account of rehabilitation expenditure, to carry forward the balance of £54,821 remaining in the appropriation account without further distribution. Shareholders will, the directors feel sure, appreciate both the necessity and the reasons for the decision.

We are pleased that the advice of the War Damage Commission's award towards the end of the year under review has at last enabled the adjustment of the relative accounts which have appeared in our balance-sheets for some years past. The Government loans have been cleared off by a set-off of 95 per cent. of the amount of the award and the balance remaining due, with interest thereon, has been repaid and charged in the appropriation account as explained in the directors' report.

BURDEN OF TAXATION

The onerous burden of taxation, computed at £342,840, is again clearly shown by the following table:—

Output—900.76 tons				
Taxation		£	Per Ton	Per Cent.
Tin Export Duty	...	106,190	108.27	22.15
Income Tax	...	160,600	163.75	33.50
Profits Tax	...	38,600	39.36	8.05
Excess Profits Levy	...	37,450	38.18	7.81
		342,840	349.56	71.51
Reserves, Writings off, etc.	...	58,546	59.69	12.21
Dividends	...	78,050	79.59	16.28
		479,436	488.84	100.00

CURRENT YEAR'S OUTPUTS

Outputs for the first five months of the current year total 284 tons. In recent months dredge No. 2 has been working through tailings left by the Japanese in the mining operations carried on by them during the period of occupation and, for some time to come, it will be working in an area a large portion of which has already been dredged to a depth of some 60 ft by dredge No. 1. Good values remain in the ground below the 60-ft level, but outputs from the partly worked ground are difficult to estimate. Outputs from dredge No. 2 must therefore be expected to vary from month to month according to the varying proportion of virgin to partly worked ground treated and to be on a lower level than those of the past two years.

In this connection, I must refer to the recent large fall in the price of tin. The average cash price for tin metal during 1952 and for the first quarter of the present year was approximately £960 per ton. A serious break in the price level developed in April and since then the cash price has fluctuated between £776 and £692.

There is no need for me to stress the serious effect which this fall must have on the position of all tin-mining companies and on the revenues of a country like Malaya, which depends so largely upon the direct, and indirect revenue it receives from the tin industry.

Your Board and the general managers are examining every possibility of reducing expenditure.

The report and accounts were adopted.

IDRIS HYDRAULIC TIN

INCREASED OUTPUT

The thirty-ninth annual general meeting of Idris Hydraulic Tin, Ltd., was held on July 8 at the registered office, 73 Cheap-side, London, E.C.

Mr. A. G. Glenister, chairman of the company, presided.

The following is an extract from his statement circulated with the report and accounts for the year ended December 31, 1952:

I wish to refer to the death, on October 13 last, of Mr. R. C. Savory, who had been a member of the Board since 1931 and chairman of the company since 1942.

The total output of 322 tons for the year 1952 was considerably above that for 1951, the increase being mainly due to the improvement in the grade of the ground treated at the Kranji Section from 2.33 lb. of tin-ore per cubic yard to 3.11 lb.

RESULT OF YEAR'S WORKING

The profit for the year, after charging taxation, is £37,752 which, added to the balance brought forward from last year, makes a total credit of £43,034. Taxation including the Excess Profits Levy amounts to no less than £64,780. £5,000 has been written off property account and £15,000 has been added to the general reserve. Dividends totalling 1s. per share have been paid and the directors recommend payment of a final dividend of 3d. per share which, less income-tax at 9s. in the £, will absorb £3,300, leaving a balance of £7,134 to be carried forward.

It will be noted that the current assets total £210,156 against current liabilities of only £45,257. Since the financial year ended the war damage award has been agreed at £40,804, after abatements common to all awards. 95 per cent of this sum has been set off in repayment of the advances received from Government towards the cost of rehabilitation.

I must point out that taxation still remains at a penal level. The figures for the year under review are as follows:

	Percentage of profit
Taxation (including tin duty £34,789)	72.5
Reserve transfer	10.9
Written off property account	3.6
Dividends	11.6
Increase in carry-forward	1.4
	<hr/> 100.0 <hr/>

FALL IN PRICE

The average cash price for tin metal during 1952 and during the first quarter of the present year was approximately £960 per ton. At the beginning of April there was a serious break and since then the cash price has fluctuated between £680 and £770. Such a large fall in price cannot fail to have a serious effect both on the profits of all tin-mining companies and on the economies of all the major producing countries, including Malaya, where a number of Chinese mines have already been compelled to shut down. Your Board are, of course, fully alive to the situation and, with the general managers, are examining every possibility of reducing costs to meet the changed outlook.

The lower price level and probable reduction in Malayan output will also gravely affect the dollar-earning capacity of the sterling area to which the Malayan tin industry has made such large contributions in recent years.

I am happy to say that it is generally felt that, thanks to the energetic measures taken by General Templer and the loyal support he has received from all sections of the community in Malaya, the security position has much improved. There is, however, still no room for complacency, and the strain on the general managers and the staff at the property remains. To them all we continue to owe a deep debt of gratitude for the way in which they have discharged their duties and for the courage and loyalty which they have shown.

The report and accounts were adopted.



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KADUNA PROSPECTORS

The thirty-eighth Annual General Meeting of Kaduna Prospectors Ltd. was held at 81 Coleman Street, E.C.2, on Tuesday last.

The following is an extract from the Statement of the Chairman, **Sir Godfrey Fell, K.C.I.E., C.S.I., O.B.E.**, which was circulated with the report and accounts for the year ended December 31 last:—

Production during the year amounted to 77 tons of concentrate of shipping grade, of which 52 tons were recovered from the recorded ore reserves and 25 tons from outside of them. Ore reserves measured and indicated at the close of the year amounted to 247 tons.

As a result of the combination of lower prices realised and higher costs the mining profit for the year, after providing for mining charges, royalties, freight, smelting charges, London charges and Directors' remuneration, was reduced from £16,309 to £12,866.

An interim dividend of 12½ per cent, less income tax, was paid on the 16th March, 1953, and provision has been made for a final dividend of 20 5/6 per cent (5d. per share) less income tax.

Prospecting during the year disclosed only two small blocks of tin-bearing ground, estimated to contain in all 16 tons, but as the overall value, allowing for yardage to cover the necessary benching for safe working, is less than 0.4 lbs. per cu. yard, it is doubtful whether this ground can be worked profitably with tin at its present price.

In attempting to estimate the prospects of the industry during the current financial year, regard must be had to the recent violent fluctuations in the price of metallic tin. At the beginning of January the price was about £940 per ton; in February it touched about £980; in April the lowest figure (cash price) reached was £687 10s. 0d.

Another factor which must be taken into account is the new form of Government set up in Nigeria. All who are interested in Nigeria and its prosperity will wish the new Government well.

It will also be our task to adapt the organization of the industry to meet, so far as practicable, the changed conditions which the Government may seek to impose.

The output for the current year, up to 31st May, was 50 tons.

The report and accounts were adopted.

KADUNA SYNDICATE

The forty-second Annual General Meeting of Kaduna Syndicate Ltd. was held at 81 Coleman Street, E.C.2, on Tuesday last.

The following is an extract from the Statement of the Chairman, **Sir Godfrey Fell, K.C.I.E., C.S.I., O.B.E.**, which was circulated with the report and accounts for the year ended December 31 last:

Production during 1952 amounted to 271 tons of tin concentrate of shipping grade, of which 172 tons were recovered from the recorded ore reserves and 99 tons from outside of them. Ore reserves, measured and indicated, at the close of the year amounted to 1,101 tons.

The net profit for the year was £20,521.

An interim dividend of 25 per cent, less income tax, was paid on the 16th March, 1953, and provision has been made for a final dividend of 50 per cent, less income tax.

The mechanical excavator was closed down most of the year owing to the invaliding of the operator. During the latter part of the year the new operator stripped the remaining overburden from the deposit on which the machine had been working, and a start was made in recovering the tin bearing wash exposed, approximately 28 tons of ore being obtained. The excavator has now been moved to the top of another section of the hill and has commenced to strip the hard laterite capping beneath which lies about 150 feet of volcanic clay overburden before the tin-bearing wash is reached.

In attempting to estimate the prospects of the industry during the current financial year, regard must be had to the recent violent fluctuations in the price of metallic tin. At the beginning of January the price was about £940 per ton; in February it touched about £980; in April the lowest figure (cash price) reached was £687 10s. 0d.

Another factor which must be taken into account is the new form of Government set up in Nigeria. It is too early yet to say how the revised Constitution will contribute to the prosperity of the country, and in particular how it may affect our industry. All who are interested in Nigeria and its prosperity will wish the new Government well.

The output for the current year, up to 31st May, was 127 tons.

The report and accounts were adopted.

ANGLO AMERICAN CORPORATION OF SOUTH AFRICA LIMITED GROUP

DIVIDENDS ON STOCK AND SHARES TO BEARER

With reference to the notices of declaration of dividends published in the Press on June 11, 1953, the following information is published for the guidance of holders of stock and share warrants to bearer.

The undermentioned dividends will be paid in British currency at par on or after August 10, 1953, against surrender of the appropriate coupons at Barclays Bank (Dominion, Colonial & Overseas), Circus Place, London Wall, London, E.C.2, or at the equivalent in French currency at Banque de l'Union Parisienne, 6 and 8 Boulevard Haussmann, Paris, 9e. Listing Forms may be obtained on application at the offices of either of these paying agents.

Coupons presented for payment at Barclays Bank (Dominion, Colonial & Overseas) will, unless accompanied by Inland Revenue declarations, be paid at the amounts shown in Column No. 12, which are arrived at after deduction of United Kingdom Income Tax (Column 11) at rates reduced to allow for relief in respect of Dominion Taxes. Coupons must be left four clear days for examination and may be presented any day (Saturday excepted) between the hours of 11 a.m. and 2 p.m.

NAME OF COMPANY (Each incorporated in the Union of South Africa)	Class of Capital	Dividend No.	Coupon No.	Amount of dividend declared per £1 Stock or per Share	South African non-resident Shareholders' tax deducted per £1 Stock or per Share	Amount of dividend after deduction of S.A. non-resident Shareholders' tax per £1 Stock or per Share	Rate of relief authorised in the £	GROSS Amount of dividend for United Kingdom tax purposes	Rate of deduction of United Kingdom Income Tax in the £	Amount of United Kingdom Tax deducted per £1 Stock or per Share	NET Amount of dividend per £1 Stock or per Share
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
				s. d.	Pence	s. d.	s. d.	s. d.	s. d.	Pence	s. d.
Anglo American Corporation of South Africa, Limited	6% Cum. Pfd. Stock	48	48	0 7.2	0.4482	0 6.7518	1 2.94	0 7.2	7 9.06	2.7918	0 3.96
Brakpan Mines, Limited	Shares	81	81	0 6	0.45	0 5.55	4 6	0 7.16	4 6	1.61	0 3.94
Daggafontein Mines, Limited	Shares	41	41	3 0	2.7	2 9.3	4 6	3 6.97	4 6	9.67	1 11.63
The South African Land and Exploration Company, Limited	Shares	30	30	1 3	1.125	1 1.875	4 6	1 5.903	4 6	4.028	0 9.847
Springs Mines, Limited	Shares	63	63	0 1.5	0.1125	0 1.3875	1 7	0 1.5068	7 5	0.5588	0 0.8287

For and on behalf of ANGLO AMERICAN CORPORATION OF SOUTH AFRICA, LIMITED.

11 Old Jewry, London, E.C.2. July 8, 1953.

W. E. GROVES, London Secretary.

The following notes are added at the request of The Commissioners of Inland Revenue:

(i) As regards the dividends payable by Brakpan Mines Limited, Daggafontein Mines Limited, The South African Land and Exploration Company, Limited, and Springs Mines Limited, under the provisions of Section 348 and the 17th Schedule of the Income Tax Act, 1952, relating to "unilateral relief" from double taxation, South African tax applicable to the dividend is allowable as a credit against the United Kingdom tax payable in respect of the dividend. The deduction of tax at the reduced rates shown in Column (10) instead of at the standard rate of 9s. 0d. in the £ represents a provisional allowance of credit at the rates shown in Column (8). The final rate of credit allowable to a particular shareholder depends on his personal rate of tax; it may be more or less than that shown in Column (8). Revision of the credit involves a corresponding adjustment of the amount shown above as the GROSS amount of the dividend for United Kingdom tax purposes.

(ii) As regards the dividends payable by Anglo American Corporation of South Africa, Limited, under the provisions of Section 348 and the 17th Schedule of the Income Tax Act, 1952, relating to "unilateral relief" from double taxation, South African tax applicable to the dividend is allowable as a credit against the United Kingdom tax payable in respect of the dividend. The deduction of tax at the reduced rate of 7s. 9.06d. in the £ instead of at the standard rate of 9s. 0d. in the £ represents a provisional allowance of credit at the rate of 1s. 2.94d. in the £ in respect of South African Non-Resident Shareholders' Tax. The final rate of credit allowable to a particular shareholder depends on his personal rate of tax; it may be less than 1s. 2.94d. in the £. Revision of the credit involves a corresponding adjustment of the amount shown above as the GROSS amount of the dividend for United Kingdom tax purposes.

THE CENTRAL MINING-RAND MINES GROUP

DIVIDENDS — JUNE, 1953

The following dividends payable to shareholders registered in the books of the Companies at the close of business on June 30, 1953, will be paid on or after August 8, 1953. The dividends on shares to bearer will be paid after surrender of the appropriate coupons at the Office of the London Secretaries of the Companies, 4 London Wall Buildings, E.C.2. or, with the exception of the Company marked with an asterisk, at the Crédit Lyonnais, Paris.

The dividends will be payable in British currency, at par, at the rates declared in South African currency (Column No. 4), less South African non-resident shareholders' tax (Column No. 5).

NAME OF COMPANY (Each incorporated in the Union of South Africa)	Divi- dend No.	Cou- pon No.	Amount of dividend declared per share	Deduction in respect of S. African non-resident shareholders' tax, per share	Amount of dividend after such deduction per share	Provisional allowance of credit authorized in the £	Gross amount of dividend per share	Rate of South African taxation applicable in the £	Rate of deduction of United Kingdom income tax in the £	Amount of United Kingdom income tax deducted, per share	Net amount of dividend per share
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Blyvooruitzicht G. M. Co., Ltd.	15	—	1 4	1.2	1 2.8	4 6	1 7.1	10 2	4 6	4.3	10.5
City Deep, Ltd.	67	67	6	0.45	5.55	3 10	6.87	—	5 2	1.77	3.78
Consolidated M. Reef M. & E., Ltd.	87	84	1 9	1.575	1 7.425	4 6	2 1.065	7 1	4 6	5.640	1 1.785
Crown Mines, Ltd.	104	104	2 6	2.25	2 3.75	1 11	2 6.69	—	7 1	10.87	1 4.88
Durban Roodepoort Deep, Ltd.	65	65	1 9	1.575	1 7.425	4 6	2 1.065	—	4 6	5.640	1 1.785
East Rand Prop. Mines, Ltd. Modderfontein East, Ltd.	67	68	1 9	1.575	1 7.425	4 6	2 1.065	—	4 6	5.640	1 1.785
52	33	1 6	1.35	1 4.65	4 6	1 9.48	8 0	4 6	4.83	11.82	
Pretoria Portland Cement Co., Ltd.	91	—	1 9	1.40175	1 7.59825	4 6	2 1.28806	—	4 6	5.68981	1 1.90844
Rand Mines, Ltd.	100	100	3 0	2.7	2 9.30	4 6	3 6.97	—	4 6	9.67	1 11.63
*Transvaal Gold M. Ests. Ltd.	85	85	6	0.45	5.55	3 4	6.66	—	5 8	1.89	3.66

Where no figure is shown in Column No. 9, the rates of South African taxation applicable in the £ cannot yet be ascertained, as they are dependent on the final particulars of the South African taxation of the companies concerned which are not yet available.

PAYMENT OF COUPONS

COUPONS presented for payment at the Office of the London Secretaries will, unless accompanied by Inland Revenue declarations, be paid at the rates shown in Column No. 12, which are arrived at after deduction of United Kingdom income tax (Column No. 11), at rates reduced to allow of relief in respect of Dominion taxes (Column No. 10). If accompanied by Inland Revenue declarations, they will be paid at the rates shown in Column No. 6. They must be left at least four clear days for examination and may be presented any day (Saturdays excepted) between the hours of 11 and 2. Depositors will be notified at the time of deposit when the cheques will be ready.

Listing forms may be had on application.

COUPONS presented at the Crédit Lyonnais, Paris, will be subject to the deduction of French income tax from the amounts of the dividends shown in Column No. 6.

Note: The Companies have been asked by the Commissioners of Inland Revenue to state:

Under the provisions of Section 348 and the 17th Schedule of the Income Tax Act, 1952, relating to "unilateral relief" from double taxation, South African tax applicable to the dividends is allowable as a credit against the United Kingdom tax payable in respect of the dividends. The deduction of tax at the reduced rates in the £ (Column No. 10) instead of at the Standard Rate of 9s. 0d. in the £ represents a provisional allowance of credit at the rates shown in Column No. 7. The final rate of credit allowable to a particular shareholder depends on his personal rate of tax; it may be more or less than the rates shown in Column No. 7. Revision of the credit involves corresponding adjustments of the gross amounts of the dividends for United Kingdom tax purposes (Column No. 8).

THE GROSS AMOUNT OF THE DIVIDEND, PER SHARE, TO BE INCLUDED IN ANY STATEMENT OF TOTAL INCOME FOR UNITED KINGDOM INCOME TAX PURPOSES IS SHOWN IN COLUMN NO. 8.

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DIVIDENDS

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Ex-Lands Nigeria 30% (July 31)
Malayan Tin Dredging 1s. 6d. i (July 31)
Premier Cons. Oilfields 15% (July 30)
Puket Tin Dredging 6d. i (July 24)
Southern Malayan Tin 1s. 6d. i (July 29)
South West Africa Co. 3½% i
Tekka-Taiping 2½% i (July 22)

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